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Income, Demand and Market Equilibrium of the High Level Medical and Health Service: A Sample of Hangzhou

Zhu Jian An

Department of Applied Economics, Zhejiang University City College and School of Economics,
Zhejiang University, Hangzhou, China

Abstract: The demand of medical care grows rapidly when the national economy and living standard are developed. This study analyses the elasticity of medical care in Hangzhou which is lower than the national average. The target of current medical reform can solve the problems of the lack of the health resources and high cost at the lowest level and neglect the higher level demand of the middle and the better-off. The reform can be trapped in the inefficient situation just like beginning of NHS of UK. Based on the supply of Hangzhou medical care in the last thirty four years, the research advises the public hospitals attract the private capitals to construct the joint medical institutions and hold the dominant position to break the deadlock of the quality of health care and service in the current civilian battalion hospitals.

Key words: Market disequilibrium of medical care, elasticity of medical care, medical reform, NHS, joint medical institutions

INTRODUCTION

Since the reform and opening up thirty four years ago, the gross domestic product of China has grown from 3645 billion in 1978 to 51.9 trillion yuan in 2012 with an average annual actual growth 9.8 per cent which is more than three times as the average rate of the world. On the basis of GDP growth, the national people can get higher material and cultural needs. Along with the urban and rural residents consumption of much more food, clothing, shelter and transportation, low-level medical care started to step up to satisfy the high-level need and improving the quality of life. But medical service is considered to lag behind and be one of the main obstacles to improve people life quality. As the Table 1 shows, in 2011 a national health expenditure on medical and health services has grown 220 times which is 2426.88 billion yuan while 11.021 billion yuan in 1978. Among them, the per capita medical care expenditure increased 157 times but at the same time resident individuals expenditure by cash grew much more rapidly and reached 375 times as the same as the rise of income of the urban and rural residents. The residents have to pay the expenditure with their cash at the percent from 20.5 to 34.9%. On the one hand, the expenditure has grown so rapidly and the situation the residents are faced with is called the high cost of health care. On the other hand with respective of supply, the growth of amount of supply is slow. From 1978 to 2011, the whole amount of hospital has increased from 9293 to 21979. The growth rate is 136.5%. Even though the

Table 1: Weight of personal expenditure on medical care

Year	Whole Expenditure National(billion)	Among them the personal expenditure (billion)	Weight
1978	11	2.252	20.5
2011	2426.88	846.6	34.9

amount of institutes of medical and health service has increased from 169732 to 954389 and the growth rate is 462.3%. And the amount of hospital beds has increased 153% Meanwhile the population has grown 40% and the hospital beds per thousand people increased only 113%, medical technician per thousand people drops from 0.8-0.6. The data implies that comparative to the expenditure of national 220 times and of personal 375 times, the supply of medical care is less than 1.2 times according to the hospitals, clinics, doctors. The supply can't catch up the demand and the citizen feel difficult and high cost of getting medical service.

DEMAND OF MEDICAL CARE IN CHINA WITH THE INCREASING INCOME

As one of the citizen consumption, obviously the demand of medical care is influenced by income to a great extent. When a household have not enough proposal income it will spend on food, clothing, shelter and transportation in order. So the money left will be few on the medical care. According to Engel Theorem with the growth of income, the expenditure on food declines and the demand to improve the quality of life, the health care in included. The expenditure was closely related with consumption cost which was inextricably linked with

income linearly (Wu, 2003). But the demand of medical care grows much more rapidly. Based on the dualistic structure in urban and rural areas, he argued that the expenditure of rural citizen was only one third of the urban because the disposable income of the former was one third of the latter. One of the determinants of health care is the income gap between the urban and rural (Yin *et al.*, 2007). This positive research which is based on the data from 1992 to 2003 found that the health care consumption had a low of diminishing marginal propensity to consume as income level rise. In the same income levels, the marginal propensity to consume of urban residents tended to be growth at the same rate with time. But among income levels, the growth rate declined with income.

As for gap between urban and rural it was necessary to reduce health-care spending difference between urban and rural residents based on the reduction of income gap with the aid of Engel model and strengthen the medical and sanitation public finance input (Zhou and Tian, 2009). The per capita income of family had the positive influence to the expenditure of medical care based on farm household micro data (Ye *et al.*, 2008). And there are two effects. On the one hand the consumption of health care was the ordinary goods which feature is the higher expenditure with higher income. On the other hand, the effect of health implied the fewer demand on medical care with better health. Both of the effects have corroborated with Grossman (1972). Not only the positive relationship between medical care and income but also the relationship between the expenditure of health and the price of medical care, were revealed by Luo and Ding (2010) on the basis of the every province from 1997 to 2007. Their panel-data analysis implied the change of medical price influenced the expenditure strongly but unnoticeably to the farmers of rural areas.

present medical service in hangzhou: According to criterion of World Bank, the weight of food in consumption expenditure-Engel Coefficient- less than 40% means a category of rich. As the Table 2 shows, the Engel Coefficient of Hangzhou as the provincial capital of Zhejiang, one of the most rapid growth provinces, both the urban and rural citizen, is less than 40% and this area step into be rich.

In 1995, the consumption of per capita of the urban citizen of Hangzhou was 5558.62 yuan, among which on food was 2774.32 yuan, 49.9% of the total expense and on medical care 145.11 yuan, 2.6%. The data of that year implied that there were 5.23 yuan on health care in correspondence with every 100 yuan on consumption. After 17 years, the consumption of per capita of the urban citizen of Hangzhou was 22800.12 yuan, among which on

Table 2: Engel's Coefficient in Hangzhou

Year	Urban			Rural		
	Con	Food	E-C	Con	Food	E-C
1995	5559	2774	0.5	2373	1213	0.51
2000	7790	3303	0.42	3393	1392	0.41
2005	13438	4682	0.35	6004	2145	0.36
2006	14472	4818	0.33	6901	2418	0.35
2007	14896	5526	0.37	7568	2636	0.35
2008	16719	6410	0.38	8446	3031	0.36
2009	18594	6972	0.37	9065	3067	0.34
2010	20218	7790	0.39	10227	3333	0.33
2011	22642	8354	0.37	12125	4076	0.34
2012	22800	8470	0.37	13612	4455	0.33

food was 37.1% of the total expense and on medical care 5.1%. The data of t 2012 implied that there were 14 yuan on health care in correspondence with every 100 yuan on consumption. And the rural had the same tendency. On the reference of food, the demand of health care is much more sensitive to income growth.

Of course, the expenditure on medical care is influenced by both the quantity of demand and the price of health care. The rapid increase of expenditure, on the one hand is the outcome of income growth and change of consumption structure, on the other hand of the higher price even the same quantity of demand. According to economics, the wealthier and better-off people give an impetus to the demand on health care. And the equilibrium of demand and supply will promote the higher price. The difficulty and high cost of getting medical service has been the hot issues in China along with twenty years' medical reform. To solve the problems of the lack of the health resources and high cost, especially to meet the health need of citizen, the supply side can't be emphasized too strongly.

Comments on the new medical reform: The medical reform dominated by government supplies the fundamental and low-level health care. The past twenty years reform on medical follow the same way as other areas which indicate the drop-off by government and let the market allocate resources with proper government regulation. The government decreases the financial support as public goods and the input from fiscal budge makes up only a small section of the all revenue of the hospitals. The hospitals have to develop by themselves based on supplying to the medical market. In the name of state-owned hospitals they are the profit-seeking business where profit comes from excessive drug expense and the medical treatment burden is heavier.

In order to construct the harmonious society, China government lets the citizens share the output of the economic growth and plans to provide the new medical reform in contrast with the previous reform which gave the heavier burden to the people and was thought of

failure. But the new reform dominated by government supplies the fundamental and low-level health care. And the reform makes the rules that the most important target of the state-owned hospital is the supply of the most fundamental medical care. From the perspective of moral, the function of health care is improving the condition of people and the equity of the society. And the big and major hospitals will be controlled and the county general-hospital will be mainly developed. As well the rural township hospitals will be perfectly constructed all over the country. The resources in appropriating funds from public finance will be given to basic hospitals.

New reform neglects the demand of high-level medical care: The reform put forward by the national department of health give the public financial funds to the level-I and level-II by means of limit the state-owned major hospitals. That means the demand of high-level medical care will be neglected. With the disequilibrium of national economy and the growth of economy, people from the economically developed areas have not access to quality service to improve the life. The state-owned hospitals have the responsibilities to service the fundamental medical care and not satisfy the diversification and individuation demands from the rich and high income persons from developed areas who are affordable to have the high quality service. The high level medical care in the new reform is the blank parts in the market and continuously new market.

Their pleas for high-level medical equipment and improved care have long fallen on deaf ears. Those people ask for quality health care beyond the basic service. The high level demand is composed by the special service and special people. The special service needs the high technical and high quality service. And the special people are those who are high-income, high-level, high-standard and high-social security.

Construction of all-dimensional and wide-ranging health care: With the development of income and living level, the disequilibrium of demand and supply is usual and suffered by people. It is universally acknowledged that the supply can't catch up the demand. The poor can't afford the medical care and the rich can't buy the high quality service as well. A preferential policy of the resource of medical on big and major hospital had been adopted. The smaller hospitals are short of the medical resources, the medical technician and equipment. Meanwhile, the big hospitals are crowded because of the complicated process and the patients who are willing to buy are difficult to get the service. It is urgent to construct the all-level medical system. By means of the

segmentation of medical care, according to varying degrees of severity the different patients can get the different hospitals service. The hospitals supply the health care to their own patients.

The all-dimensional, multitier and wide-ranging health care based on demand consists of four level services. The first level is the basic service in the community to supply the medical work which are ailment medical treatment, unfolding community prevention, community health care, build health record, the subsequent treatment on chronic disease and to give community recovery and take health education. The second is the hospital service of the county level to work on all kinds of common disease, frequently-occurring disease. The third is the central hospitals of regions to work on the diagnosing exotic ailments, the guide and reeducation to the regional medical technician. The fourth is the high level service to solve the great medical treatment and satisfy the high-income demands on high quality and special services. In details, they accept the transferring patient from another central hospital to Diagnosis and treat the great and difficult disease and research on the new technical to the advanced methods in the country, even in the world. Meanwhile, these hospitals satisfy the diversification and individuation demands from the rich and high income persons from developed areas who are affordable to have the high quality service.

EMPIRICAL RESEARCH ON THE DEMAND AND SUPPLY OF HIGH LEVEL MEDICAL CARE

Research on the demand of high-level service based on the demand elasticity of income: The demand of health care has not been released effectively. The experience from the developed counties and typical areas reveals that the demand on the service grows and on the manufacturing industry declines when the per capita GDP reaches 5000-8000 US dollars. Wu (2003) found that the consumption on food, dress and shelter elasticity of income is 0.3 from 1875 to 1995 which means the consumption on food, dress and shelter will only increase 0.3% if the income adds 1%. At the same time, his research implied that the consumption on education and health care elasticity of income is 1.6 in the same period which means the consumption on education and health care will increase 1.6% if the income adds 1%. The change of consumption structure is the same as other areas and the regular law with the economic development. Based on the China Health and Nutrition Survey from 1991 to 2004, Ye *et al.* (2008) calculated that the expenditure elasticity of income of medical in rural areas is 0.19 and considered the demand of health is essential commodity.

Table 3: Demand elasticity coefficient of income

Year	City dweller			The 20% highest income people		
	Dispo-sable income	Expend-iture on health	Elasti-city	Dispo-sable income	Expend-iture on health	Easti-city
2012	37511	1158.80	1.27	77989	018.95	2.17
2011	34065	1026.95	0.25	69781	1609.08	0.98
2010	30035	994.16	0.29	60312	1394.02	0.34
2009	26864	961.47	-1.32	53402	1335.24	-4.28
2008	24104	1132.49	1.66	49506	2014.34	2.31
2007	21689	955.53	0.57	44065	567.70	2.30
2006	19027	884.82	-0.68	38742	1191.30	-0.68
2005	16601	983.06	1.07	33059	349.04	0.24
2004	14564	855.36	-0.16	28212	1294.71	-2.83
2003	12898	873.61	1.80	27135	458.86	3.96
2002	11778	746.18		25834	1216.10	

The GDP of Hang Zhou was 509.9 billion yuan in 2009, comparative of 4.06 billion in 1980 which is 125.4 times with delivering double-digit growth for 19 years. According to Registered Permanent Residence and resident population separately, the per capita GDP is 74924 yuan and 63471 yuan, equally US\$10968 and US\$9292 with the average exchange rate this year. The economic development provides the possibility to enlarge the demand of health care. The Engel coefficient of Hangzhou is 0.371 which meets the criteria of rich. Especially, the upon 20 percent people, about 800 thousands, belongs to very rich level. But in the past six years, they spent 1200 yuan to 1600 yuan on health care, less than 1 percent of all consumption.

As usual, the expenditures on medical care of rural areas are concentrated on the most basic service because of the lower income than the urban. This study thinks the elasticity of medical demand of high-income is bigger than the poor. Depend on the data of National Medical Expenditure and Income for long term from 1985 to 2005, Gu and Zhang (2008) argued that the expenditure of health care of residents of the urban will increase 1.6847% if the income adds 1% and the elasticity of demand is 1.6847. Meanwhile, the elasticity of resident of the rural is 1.4688. But in the short time, the elasticity of health care changes modestly because of the daily habit. The short term elasticity of city dweller is 0.818 and 0.7138 of farmers.

As the Table 3 reveals, the demand elasticity coefficient of income on medical care of residents in Hangzhou from 2003 to 2012 is confusingly fluctuating from -1.32 to 1.80 with impulse type. The elasticity coefficient drops down just after the rising coefficient year. But the coefficient of the rich fluctuates more sharply than the one of the average. That means that the demand of health care will be released effectively at the same time with the rising of the disposable income.

Shortage of supply on medical care in Hangzhou: The supply on medical care is deficit generally in Hangzhou, let alone the high level service. In the end of 2012, this

provincial capital, Hangzhou has 3017 institutes of medical and health service, including 198 hospitals, 71678 medical technician, 22753 certificated doctors and 49471 hospital beds. It seems that the supply in Hangzhou is abundant in medical care in contrast with other cities in Zhejiang Province.

But let us make a historical comparison as well as region comparison in the same province. The present resources are much less than the climax in the beginning of 1990 approximately. Although the absolute quantity nowadays is increasing along with the increasing number of population, the per-capita share of medical resources is still small. Even the resent years, the certificated doctors and hospital beds every thousand have increased again. The shortage of supply is the restrictive factor for development of human being.

THE MECHANISM DESIGN OF HIGH LEVEL MEDICAL SERVICE

Private hospitals are scarce of medical resource, technology and reputation: The private hospitals which are thought of profit-seeking business are scarce of medical resource, technology and reputation. The private hospitals have not the ability to supply the reliable, quality and a large scale health care. For example, in Shanghai there are 2000 private hospitals and average registered capital is less than 10 millions, the average beds is less than 50. It is of the most importance that the results of operative exploration in concord with diagnos in those hospitals are from ten percent to fifteen percent lower than the average of the city. The satisfactory rate of service and medical equipment on private hospitals and from the high-level people is 6 and 15.3%.

Marketization of high level medical service: The high level medical care can't go without the state-owned hospital which have developed and been in service for decades. Meanwhile, the state-owned hospitals have the responsibility to supply fundamental service to all citizens

as nonprofit organization. Nowadays, public hospitals have been criticized by people because they are not in reasonable position. Xu (2006) the displace of government to market results in the rigidity of pricing in medical market and the high expenditure of medicine in hospital which gives the burden of patient and his family. Huang and Yu (2009) from one hospital finance department of Hunan Province in central of China assured the high expenditure on medicine. In outpatient or inpatient, operation or not, the department of internal medicine or surgery, the drug expense which exceeds the sum of the cure cost and examine common bed expends cost, take over a half or near a half of the all expenditure. They attributes to the profit-seeking of public hospitals. So the traditional public medical institutes can't provide satisfactory high-level service.

The restrictions of high level medical service are the medical resource, technology and reputation. And those resources are concentrated in public hospitals. If those hospitals provide the high level service, a lot of people will lose the access to basic care. The present reform can be trapped in the inefficient situation just like beginning of NHS of UK. So the public hospitals can attract the private capitals to construct the joint medical institutions out of the previous hospitals and hold the dominant position to break the deadlock of the quality of health care and service in the current civilian battalion hospitals.

CONCLUSION

The demand of medical care grows rapidly when the national economy and living standard are developed. This study analyses the elasticity of medical care in Hangzhou which is lower than the national average. Unfortunately the target of current medical reform can solve the problems of the lack of the health resources and high cost at the lowest level and neglect the higher level demand of the middle and the better-off. Based on the supply of Hangzhou medical care in the last thirty years, the research advises the public hospitals attract the private capitals to construct the joint medical institutions and hold the dominant position to break the deadlock of the quality of health care and service in the current civilian battalion hospitals.

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