

The effect of implementing “medicines zero mark-up policy” in Beijing community health facilities

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During the planned economy, free medical services were provided to everyone in China. Public health facilities heavily relied on government subsidies and the government set a price which was far below real costs. Medicines mark-up by public health facilities was first allowed in 1954, when the Chinese economy experienced the most difficult times [1]. Such a policy gradually evolved into a perverse incentive along with the economic reform starting from 1978, when public health facilities were encouraged to generate revenues and were allowed to issue bonuses. In turn, the income of individual staff was directly linked with revenue generation. The unchanged low level medical service fee forced providers to generate more revenue from mark-up of medicines. This contributed to unnecessary prescriptions written by doctors. Doctors preferred expensive medicines and poly-pharmacy, which contributed to increased medical cost and public out of pocket expenditure [2].

Beijing implemented the “medicines zero mark-up policy” in community health centers (CHCs) in 2007. The aims of the policy were to eradicate the afore-mentioned incentives, contain the medicines cost, and reduce the financial burden to the public [3]. Policy-makers selected 312 medicines based on the national essential medicines list. The CHCs were required to procure these medicines via government pooled tendering. Procurement and prescribing of “non zero mark-up medicines” was allowed and the CHCs were to dispense these medicines at the procurement price [4]. Government subsidized CHCs via three financial approaches: (1) in high socioeconomic districts, the government allocated fixed subsidies to CHCs and all expenditures of CHCs were secured according to defined standards. Even in areas of deficit, the government subsidy was

still allocated to CHCs. No surplus was allowed to be retained by individual CHCs; (2) in the poorer districts, the government allocated income-linked subsidy, covering only staff and not other operational costs. The amount of subsidy was related to revenue generated; (3) for a few specific CHCs, the government did not bear their operational costs, but purchased services from them, i.e. compensated the mark-up loss from selling “zero mark-up medicines” based on their historical medicines sales. These CHCs were responsible for balancing expenditure against revenue and had the autonomy to retain any surplus [5, 6].

There are a number of studies which have analysed the changes of medicines cost for patients in specific facilities after implementation of this policy in Beijing [7-10]. Li's [7] regression analysis model showed that the government subsidy approach was a very important factor towards total medicines cost. We also conducted a study evaluating the effect of the “medicines zero mark-up policy” on both patients and providers. Changes in utilization of “zero mark-up medicines”, medicine costs per visit, government subsidy, medicines and medical revenue of CHCs, and CHC staff salaries were measured before the introduction of the “medicines zero mark-up policy” in 2006 and then three years following implementation of the policy. Different subsidy approaches among CHCs were also compared. We divided the CHCs into 3 groups according to government subsidy approach and randomly selected 20% of the total number of CHCs adopting the same government subsidy approach in each district [11] (see Table 1.). All data were directly obtained from a health information database of the CHCs. Statistical analysis was undertaken using by SPSS® version 17.0.

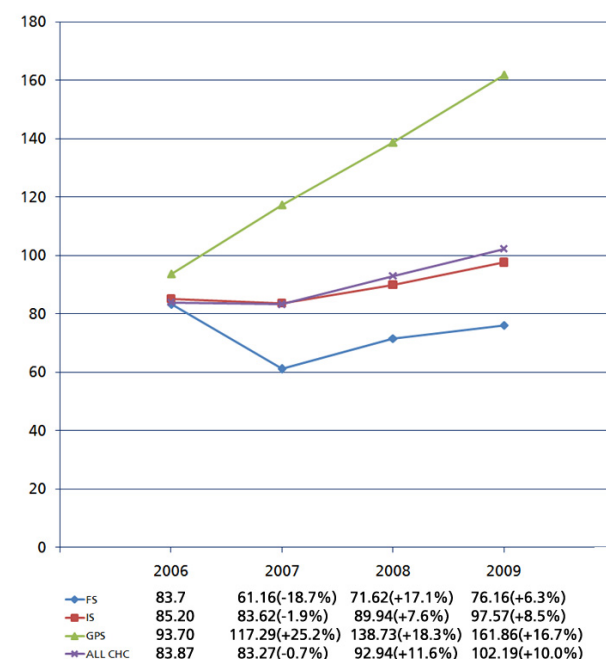
Table 1: CHC sampling scope and distribution in each district of Beijing

	Name of districts	Number of CHCs	Sample number	Fixed subsidy CHCs		Income-linked subsidy CHCs		Government purchase of services CHCs	
				Number of CHCs	Sample number	Number of CHCs	Sample number	Number of CHCs	Sample number
				Total	351	70	91	17	214
Fixed subsidy districts	Dongcheng	40	6	40	6	0	0	0	0
	Xuanwu	8	2	8	2	0	0	0	0
	Chongwen	5	2	5	2	0	0	0	0
	Yanqing	15	3	15	3	0	0	0	0
	Sub-total	68	13	68	13	0	0	0	0
Fixed subsidy & government purchase of services districts	Fangshan	24	4	23	4	0	0	1	0
	Sub-total	24	4	23	4	0	0	1	0
Income linked subsidy & government purchase of services districts purchase of services districts	Xicheng	7	3	0	0	6	3	1	0
	Chaoyang	42	6	0	0	34	4	8	2
	Fengtai	23	4	0	0	13	2	9	2
	Shijingshan	8	4	0	0	2	2	7	2
	Haidian	26	6	0	0	20	4	6	2
	Mentougou	11	4	0	0	9	2	2	1
	Tongzhou	30	4	0	0	19	3	11	2
	Sub-total	172	36	0	0	127	25	45	11
Fixed subsidy districts	Changping	15	3	0	0	15	3	0	0
	Daxing	20	4	0	0	20	4	0	0
	Huairou	16	3	0	0	16	3	0	0
	Pinggu	18	4	0	0	18	4	0	0
	Miyun	18	3	0	0	18	3	0	0
	Sub-total	87	17	0	0	87	17	0	0

The results show that the proportion of “zero markup medicines” cost to total medicines cost per visit quickly increased in all CHCs in 2007, were maintained in 2008-9, and were achieved in 75.4%, 57.8%, and 52.6% in the fixed subsidy, income-linked subsidy and government purchase of services facilities respectively. CHCs with fixed subsidies demonstrate greater willingness to use “zero mark-up medicines”.

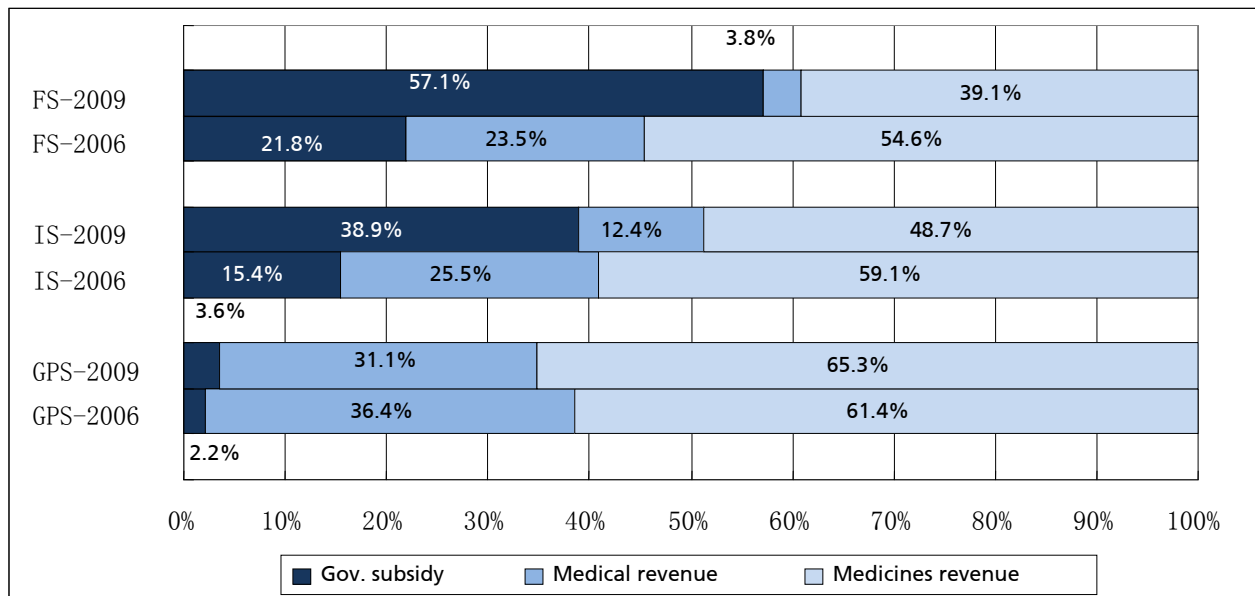
The primary data are not normally distributed and a natural logarithmic transformation was undertaken in-order to normalize the data. The following statistical tests were undertaken: (1) paired t-test for medicines cost per visit in both types of facilities in 2006 and 2007; (2) independent samples t-test for reduction of medicines cost per visit between 2006 and 2007 in both types of facilities. The results showed that there is a significant difference between the reductions in fixed and income-linked subsidy facilities ($P=0.016$, $\alpha=0.05$, t test). The medicines cost per visit in government purchase of services facilities increased 25.2% in 2007, and kept growing during 2008-9, which is in line with the results of other studies conducted in recent years [7-10](Figure 1.).

Figure 1: Medicines cost per visit in 70 sample CHCs during 2006-9 CNY



The government purchase of services facilities generated relatively more medicines revenue and less medical revenue, while both medicines and medical revenues generated by the other two types of facility decrease (Figure 2.). The annual staff salary in all CHCs continued to rise during 2006-2009. Wang’s study [9] showed the same increasing trend of CHC staff salary in Beijing in 2007-8. Facilities were government purchased services always had the lowest staff salary. Income-linked subsidy facilities consistently had the highest staff salary costs.

Figure 2: Proportion of government subsidy, medical & medicines revenue to the total income in 70 sample CHCs



Fixed subsidy facilities are more willing to adopt “zero mark-up medicines”, which is probably due to the receipt of full financial support from the government and therefore they have reduced financial pressures. These CHCs have no autonomy to keep any surplus generated and so there is neither incentive for them to generate more revenue nor incentive to procure medicines outside the essential medicines list.

In the facilities where governments purchase their services budgets are not controlled by the government and so these CHCs have a strong incentive to generate revenue. These CHCs prefer “non zero mark-up medicines” in-order to generate greater medicines revenue. Income-linked subsidy facilities can potentially generate more revenue by requesting a greater level of government subsidy. Budget management may help to restrain such intentions, so these CHCs have moderate incentive to prescribe “non zero mark-up medicines”. Such “incentive” and “absence of incentive” also affects other aspects of performance. Medicines costs are better contained however maintaining a level of enthusiasm for revenue generation is impacted on by fixed subsidy approaches. With the revenue generation incentive and relatively easing of control on medicines use, the government purchase of service facility would pursue the maximum of both quantity and unit price for service provided. On the one hand these CHCs try their best to attract more patients and provide more services, on the other these facilities would prescribe more medicines (either “zero mark-up medicines” or “non zero mark-up medicines”) in-order to request greater government subsidy or to earn a higher level of more mark-up.

The result regarding levels of staffing salaries warrants consideration. It is assumed that with increased revenue the CHCs supported through government purchase of services should have higher salaries but this study suggests the contrary. It is possible that these CHCs did not disclose full income data so as not to affect future requests for subsidies from the government. This type of CHC is very likely to have un-official bonuses to stimulate and maintain enthusiasm for work. Salary scales in fixed subsidy facilities were significantly improved following the introduction of the “medicines zero mark-up policy” with the security of full government subsidy being in place.

The “medicines zero mark-up policy” does help in containing the rising trend in costs of medicines. The medicines cost per visit was significantly reduced one year post the policy implementation. Fixed subsidy approach was found to be more effective in reducing financial burden for patients.

There are several limitations of this study and the results need to be considered with respect to these, and further research undertaken. Data were collected from randomly sampled CHCs and factors such as facility scale and operation status were not considered. This may not fully reflect every specific aspects of the effect of policy. In responding to the inflated costs in 2008 and 2009, the study did not involve in-depth key informant interviews to explore the reasons behind this and whether it was provider driven or demand driven. The assumption is made that a more comprehensive and consistent medicines use regulation

is needed. No in-depth analysis of the contributors (changes of number of visits and quantity of medicines per prescription) to the differences in medicines and medical revenue generated by facilities was undertaken. Further, the study does not evaluate whether the quality of care provided by these facilities is affected by this policy and there is no understanding of the levels of satisfaction of the public and CHC staff. This is a rich area of future research and the current study provides a platform for doing more.

Authors' contribution

The conception and design of this evaluation study was contributed by the team led by WC. WC coordinated the process of data collection and analysis. JS contributed to the data interpretation, manuscript drafting, and critical revisions of the paper. YF and DF undertook the statistical analysis. DF and XS contributed to data analysis and interpretation. JL significantly contributed to the data collection.

Conflict of interest statement

All authors declare that they have no conflict of interest.

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