Family Medicine and Community Health
ORIGINAL RESEARCH

Separation of Revenue and Expenditure increases first contact care in community health centers among community residents

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Abstract

Objective: To evaluate the impact of Separation of Revenue and Expenditure (SRE) on the first contact care in community health centers (CHCs) among community residents.

Methods: Data was obtained through questionnaire survey before and after the pilot. Residents who visited CHCs within two weeks before the conduction of the surveys were included in this study. This study employed a pre-post quasi-experiment design and multiple regression models were specified based on the Andersen theoretical framework.

Results: Multiple logistic regression analysis showed that the rate of first contact care in CHCs increased by 28. 3% (P=0. 000).

Conclusions: SRE has increased the first contact care in CHCs among the community residents.

Keywords: Separation of income and expenditure, First contact, Community health care, Impact evaluation

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Introduction

The Separation of Revenue and Expenditure (SRE) is a new financial budgetary system that has been implemented in community health centers (CHCs) in some areas in China. Before this new policy, the CHCs generated the revenue by fee-for-service and kept the revenue. So there was a strong incentive for doctors to overprescribe drugs, and it resulted in the patients bypassing community health care to more expensive secondary or tertiary care. In order to remove this inappropriate incentive and to promote more use of cost-effective community health care or primary health care, SRE was piloted in Beijing in 2006.The rationale of SRE is that the revenue generated by CHCs is required to be sent to local Bureau of Finance, and Bureau of Finance provide CHCs the budget based on the cost of running community health services. The policy would ensure that the CHCs would focus on providing more basic medical services and public health services to meet the people's needs, rather than overtreatment. This policy may help attract more residents to choose the CHCs as the first point of medical contact by controlling overtreatment, lowering the medical costs, and promoting the provision of more high-quality basic medical services and public health services. However, the empirical study of the effect of SRE on the first contact cares in CHCs is rare.

The present study is aimed to examine the

effect of SRE on rate of first contact care in CHC among community residents through household surveys before and after the SRE pilot.

Methods

Samplings

This study was a part of the program "Comprehensive Impact Evaluation of Payment Reform to Community Health in Taoranting Community Health Centers in Xicheng District of Beijing". In the program, the community residents aged above 15 years old were recruited from 10 communities in the district through stratified cluster sampling. Two surveys were conducted in February 2009 before the SRE pilot and from July to August 2011 after the pilot. There were a total of 1717 individuals in the survey before the pilot and 1294 individuals in the survey after the pilot. The information on detailed socio-demographic information, health condition, health knowledge and behavior, and expenditures and utilization on health care services was collected. In this study, those who visited CHC within two weeks before the conduction of each survey were included. The numbers of the samples were 95 and 146, respectively.

Measurements

Independent variables were selected based on the Andersen and Newman model [1]. According to this model, the predisposing variables, enabling variables and need for health care services are the fundamental influential factors of the usage of health services. Using this model, we classified age, sex, and education level as predisposing factors; average monthly income and health insurance status as enabling factors; and chronic disease as need for health care services. The dependent variable was whether the residents chose the CHCs as the first point of medical contact. The definition and measurement of the variables were presented in Table1.

Statistical analysis

This study employed a pre-post quasi-experiment design, measuring the dependent variables and independent variables before and after the pilot. And single-difference method was applied to identify the impact of SRE. The model is

$$Y_i=a_0+SRE+a_2\times\sum X_i,$$

In this model, Yi is 1 if the patient has the first contact in CHCs, and otherwise it is 0. SRE is 1 if the pilot is launched, otherwise it is 0. Xi represents the confounding factors including age, sex, education level, average monthly salary, heath insurance status and the chronic diseases. Multiple logistic regression was used to estimate the coefficients in this model. Epidata 3.01 was used to input the data, and Stata Version 11.0 was used to perform the analyses.

Results

General information of the residents was presented in Table 2. A majority of residents in this sample were female (56.8%), aged between 45-59 years (34.7%) or above (45.3%). The education level of the participants was relatively low, nearly half (48.4%) junior high school or below; and 73.7% of the participants were under the cover of health insurance for urban workers. Before the pilot, only 31 people had the first contact health care in CHCs, which accounted for 32.6% of all participants; while after the pilot, 89 people (61.0%, 89/146) received first contact care in

Table1. Definition and measurements of variables

Variables	Definition and measurement
Dependant variable	
First contact care received in CHCs	Whether the residents received first contact care in CHCs within 2 weeks before the survey. 1=Yes , 0=No (in private clinics, pharmacy or the Municipal Hospital)
Independent variables	
Implementation of SRE,	0=before the pilot, 1=after the pilot
Sex	0 =male, 1=female
Age(years)	1="18-44", 2="45-59", 3="> 60"
Education level	1=junior high school or below, 2=senior high school or vocational school, 3=college or above
Health insurance status	1=Health insurance status for urban workers, 2=at one's own expense or other insurance
Average Monthly income(RMB)	1="<2,500", 2="2,500-5,000", 3="> 5,000"
Chronic disease	0=no,1=yes(with one or more of the following chronic conditions: hypertension, diabetes, stroke, myocardial infarction or other chronic disease)

Table2. Characteristics of the sampled residents in the survey (*n*,%)

	Before the pilot (*n*=95)	After the pilot (*n*=146)	Total (*n*=241)
Sex			
male	41(43.2)	61(41.8)	102(42.3)
female	54(56.8)	85(58.2)	139(57.7)
Age(years)			
18-44	19(20.0)	26(17.8)	45(18.7)
45-59	33(34.7)	56(38.4)	89(36.9)
60 +	43(45.3)	64(43.8)	107(44.4)
Education level			
junior high school or below	46(48.4)	62(42.5)	108(44.8)
senior high or vocational school	20(21.1)	39(26.7)	59(24.5)
junior college or above	29(30.5)	45(30.8)	74(30.7)
Health insurance status			
health insurance status for urban workers	70(73.7)	117(80.1)	187(77.6)
at one's own expense or other insurance	25(26.3)	29(19.9)	54(22.4)
Average Monthly income (RMB)			
< 2500	36(37.9)	40(27.4)	76(31.5)
2500-5000	38(40.0)	66(45.2)	104(43.2)
> 5000	21(22.1)	40(27.4)	61(25.3)
Chronic disease			
no	50(52.6)	85(58.2)	135(56.0)
yes	45(47.4)	61(41.8)	106(44.0)
First contact care			
in CHC	31(32.6)	89(61.0)	120(49.8)
not in CHC	64(67.4)	57(39.0)	121(50.2)

CHCs .

Logistic regression is frequently used to generalize the odds ratio (OR) in cohort studies and clinical trials. If the prevalence of an outcome of interest is low in the study population, the OR approaches the relative risk (RR), while if the prevalence is higher than 10%, OR will overestimate RR [2]. In the present study, the marginal fixed effect (MFE) was estimated with Stata to approximate a risk ratio from the adjusted OR and derive an estimate of an impact effect that better represents the true RR. As expected, after controlling all the relevant confounding variables, the rate of the first contact care in CHC increased by 28.3% after the pilot, which was at a significant level (P=0.000, see Table 3).

Discussion

SRE had substantial impact on the first contact care, and its rate in CHCs increased by 28%. In 2006, the State Council in China released "Guidance on Developing Community Health Service", and proposed to establish hierarchical medical and dual referral systems, and explore and carry out the pilots of the first contact of medical care in the CHCs. It is important to establish the service delivery model to increase the first contact of medical care in CHCs, since this system can reduce the growth of medical costs and distribute the medical resources effectively [3]. The effective work of the community medical staff may help to improve the health knowledge and health behavior, and prevent or delay the progression of chronic disease among community residents [4].

Our finding indicates that SRE has improved the rate of first contact care in CHCs among the community residents. The root cause is that the policy has changed CHCs' revenue gathering model, and facilitates the community doctors to focus on providing more high-quality primary care and public health services to the residents.

Historically, CHCs were financed by their own revenue from medical services, which was the so-called phenomenon of "Compensating Medical Treatment Income with Drug Income" (CMTD). And the performance of doctors was also measured by the income of their departments or centers. To sustain the business and increase their income, the CHCs might provide excessive drug or unnecessary medical examinations instead of chronic disease management, public health services and health education. However, the prerequisite of SRE is that the government needs to provide sufficient budgets for the CHCs. In this way, CHCs have no need to seek profits by over-providing medical services or prescribing those expensive but unnecessary drugs, so overtreatment is controlled and medical cost is reduced [5]. And the performance evaluation

Table3. Logistic regression analysis of the impact of SRE on the first contact care in CHCs

	Coefficients	Percentage Change	*P*
SRE (ref: before the pilot)	1.171	0.283	0.000
Sex(ref:male)	0.474	0.118	0.093
Age(ref:18-44)			
45-59	0.313	0.078	0.474
>60	0.917	0.225	0.064
Education level(ref: junior high school or below)			
senior high school or vocational school	0.538	0.133	0.203
college or above	0.790	0.194	0.046
Health insurance status (ref: Health insurance for urban workers)			
at one's own expense or other insurance	-0.595	-0.146	0.080
Average Monthly income (ref:<2,500)			
2500-5000	-0.495	-0.123	0.135
>5000	0.117	0.029	0.765
Chronic disease(ref: no)			
yes	-0.464	-0.115	0.139

system of the doctors is also changed, in which the performance is measured by the quality of the services and patient satisfaction. CHCs shift attentions from generating revenue through selling drugs and ordering tests to providing appropriate care. They began to provide more public health services and high-quality basic medical services [6]. And the better, more affordable, and convenient services in CHCs help the centers attract more and more residents.

The present research is one of the few quantitative studies to examine the rate of first contact care in CHCs and its association with SRE [7]. This study evaluated the net effect of SRE policies on the rate of the first contact care in CHCs by controlling confounding factors. The limitations of our study should also be noted. Since the SRE were implemented in the whole city of Beijing, the control group could not be established, which might make the results biased.

To sum up, SRE provides financial guarantee for the implementation of first contact care in CHCs, and also has established the performance evaluation system for doctors to carry out more high-quality community public health and basic medical services. It promotes CHCs to provide convenient, timely, effective, continuous, economy, and comprehensive primary health service for residents.

Competing interests

The authors declare no competing interests.

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