Comparing the services and quality of private and public clinics in rural China

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After 15 years eradication of the private health sector in Socialist China, private practice was restored in 1980 along with the market oriented economic reform. In recent years, however, debates on its pros and cons are increasing. Arguments against private practice have led to a ban on private practice in some rural counties. The arguments against private practice state that the service quality of private clinics tends to be lower than that of public ones; private clinics are less likely to provide preventive care; and private clinics are more likely to provide over-treatment. This paper presents the major findings from a study conducted in China, aiming at comparing private and public village health clinics in terms of quality of services, willingness to provide preventive care and over-prescription of drugs. While it was found that the quality of services was poor and a large proportion of patient expenditure was due to over-treatment for all village clinics, there was no difference between public and private clinics. Both private and public clinics were willing to provide preventive services if they were subsidized for the provision. This study finds no evidence that care provided by private clinics is inferior to that of public clinics.

Introduction

The private health sector in China has experienced dramatic changes since 1950. Before the 1950s, the provision of health care was dominated by the private sector. Following the communist party's take-over of the government in 1949, private practice and private ownership of health care facilities were thought incompatible with socialism and elimination of the private health sector was put onto the agenda. After 6 years of socialism, in 1956, the predominant role of the private health sector was replaced by a publicly owned health system. The Cultural Revolution, which began in 1966, accelerated the speed of private sector elimination. By 1967, the private health sector, including individual and group practices and private hospitals, had been completely eradicated (Liu et al. 1994).

In 1980, private practice began to revive, since private ownership was no longer seen by the government to be an enemy of socialism. In addition, the privatization of the health care market was driven by a shortage of health services provision in both urban and rural areas. In urban areas, where public providers were funded by government budgets and their medical fees were regulated at lower-than-cost levels, there was a long waiting list for inpatient care and outpatient services were crowded. In rural areas, the demise of the collective economy meant the collapse of financing sources for rural village clinics. A large number of village clinics had to close due to lack of funds, and many village doctors had to abandon their medical practice due to lack of remuneration.

Facing a shortage of medical services, a policy that permitted qualified medical professionals to engage in private practice was issued by the state government in 1980, and reconfirmed and detailed in later years (State Council 1995). Pure public ownership in the health sector was broken. The growth of private medical practices was not fast but steady from 1980 to 1990. At levels of township and above, about 1.2% of health workers engaged in private practice in 1983, and this number increased to 3.3% by 1990 (Ministry of Health 1991). At village level, however, the growth of private practice increased rapidly. While there were no private practitioners in rural villages in 1980, they formed 47.5% of practitioners in 1990 (Ministry of Health 1991).

Although the development of private practice was already a fact, debates related to whether government should ban privatization and limit the scale of private practice have never stopped. Arguments in favour of private practices were that the development of the private health sector could improve access to health services, and that efficiency and quality could be improved by introducing competition into the health care market (Fei 1988; Meng et al. 1994). However, the development of private practices was sharply criticized by some people.

Three disadvantages were often asserted in this criticism:

(1) In contrast to views that private providers provide higher quality services than public ones in other developing countries (Bitran 1995; Newbrander and Rosenthal 1997), the quality of health services provided by private

clinics in China was frequently stated as poor (Nanquan County Government 1983; Lin and Ma 1990). Two major rationales were often used to support such statements: that private practitioners were usually less qualified for medical practice, and the behaviour of private doctors was more likely to be driven by financial motivation regardless of the health benefit to patients (e.g. private doctors were less likely to refer patients to a higher level of care when referrals were needed).

(2) Private village doctors were thought to be less willing to provide preventive care than doctors working in public clinics because preventive services were not economically profitable.

(3) Private practitioners were more likely to induce patient demand and provide unnecessary care and drugs for a greater profit since their income came totally from charges for services (Hou 1990; Liu et al. 1994).

The debate on the pros and cons of private practice has not yet been conclusive because most reports were based on either hypothetical arguments or anecdotal cases. And with empirical evidence lacking, the debate has led to inconsistent local policies. While some county health authorities have taken actions to restrict the development of the private health sector (Wang 1996; Weihai Municipal Government 1998), others insisted on the privatization of the medical market (Zhang and Wei 1988).

Against this background, this study was conducted in 1997. Because large numbers of private practices were located in rural villages and about 60% of medical consultations were provided by village clinics (Ministry of Health 1995), only clinics in rural villages were included. The study compared private and public clinics in terms of the quality of care, their willingness to provide preventive care, and the likelihood of providing over-treatment. The following section describes the study methods, including study site, sampling, operational definition of ownership, and methods of measurements for quality, willingness to provide preventive care and over-treatment.

Methods

Study site, sampling and data collection

The study took place in Shandong Province, which is a peninsular located on the east coast of China. It is one of the most developed provinces in China and has 130 counties and a population of 87 million.

All counties were divided into three groups according to their levels of economic development. From within each group, one county was randomly selected. Within each of the three selected counties, three townships were randomly selected. All villages with only one clinic in the nine townships constituted a sample of 109 village clinics of different ownership.

Data from the sample clinics were collected in 1997 by the trained interviewers (faculty members and master students of public health in Shandong Medical University), through face-to-face interview of village health workers with interviewer-administered questionnaires, observation of the clinics by interviewers, and review of the technical and administrative clinic records. In addition, to evaluate the quality of village clinics, five medical doctors in each of the nine township health centres were interviewed.

Operational definition of ownership

In China, private practice takes place only in private clinics. The differentiation of public from private clinics is based on clinics' ownership. Besides purely public and private village clinics, some clinics fell between these two extremes. For example, in a clinic, buildings may be owned by a village collective, while the medical equipment and drugs may be owned by the individual health worker(s). In this study, four types of ownership were defined according to the ownership shares of clinic assets (including buildings, equipment, drugs and variable fund) by private individuals and village collectives. The monetary value of land was not considered because the land occupied by both private and public clinics belonged to the State at the time of investigation. The 109 clinics were thus divided into four groups: pure public clinics, pure private clinics, mixed ownership–private dominant clinics (the share of private assets is more than or equal to 50% and less than 100%), and mixed ownership–public dominant clinics (the share of private assets is less than 50% and more than 0%). The major differences between a typical pure public clinic and a typical pure private clinic are: the assets of the former are owned by the village public, while the assets of the latter are owned by one or more of the private village doctors; the income of private doctors is only from fee-for-service charges and profits from selling drugs, while the income of public doctors may be from the subsidization of the village collective in addition to the sources of income of private doctors.

Measurement of quality

There is no uniform methodology for measuring quality of health care. The method commonly used is to measure respectively three quality dimensions: structure, process and outcome (Newbrander and Rosenthal 1997). In this study, given that village clinics lacked well-kept medical records and related medical documents, four indicators that are observable and measurable were selected for measuring clinic quality. These indicators are quality of health workers, amount of medical equipment, working conditions, and clinic supervisors' evaluation. Since village clinics are very small health units with one to two health workers and limited medical technology and equipment, to a large extent the quality of the health workers will determine the quality of the services provided. The four indicators were measured for each type of clinic and then compared between clinic groups.

Quality of health workers

Most of the health workers in village clinics were not educated in formal medical schools. Their levels of medical practice were usually determined by length of training received and length of medical practice. The quality of clinic health workers in this study was therefore assessed by the weighted

sum of the following ratios: the ratio between the average number of years of non-medical education of health workers of a clinic (X_1) and the average number of years of non-medical education of all heath workers of sample clinics (M_1); the ratio between the average number of years of medical practice of health workers of a clinic (X_2) and the average number of years of medical practice of all health workers of sample clinics (M_2); the ratio between the average number of months of medical training received by health workers of a clinic (X_3) and the average number of months of medical training received by all health workers of sample clinics (M_3); the ratio of the average number of months of medical training of health workers of a clinic within the year prior to the survey (X_4) and the average number of months of medical training for all health workers in the same period (M_4). The quality score of health workers (I) was expressed as:

$$I = (X_1/M_1)W_1 + (X_2/M_2)W_2 + (X_3/M_3)W_3 + (X_4/M_4)W_4$$

where W_1 through W_4 are the weights reflecting relative importance of the indicators of health worker quality. The Ws were determined based on the average rating scale of the importance of each quality indictor rated by an expert panel consisting of 10 health policy researchers and 10 health policy makers. The weights were 0.31, 0.30, 0.21 and 0.18, respectively.

Amount of equipment

The Department of Medical Service Administration of the Ministry of Health (1993) regulated that the minimum amount of basic equipment a village clinic should have is 14 pieces. Amount of medical equipment was used for assessing the quality of a clinic in terms of availability of basic diagnostic and treatment instruments. Average scores for the four types of clinics were compared.

Working conditions

Working conditions were scored by investigators by observing availability of the following: sanitation toilet, electricity, separation of office with observation room and paved dust-prevention floor. One point was given to each of the four items if it was available; the full points score being 4. The score of a clinic's working conditions is derived by the actual number of points divided by the full number of points. Average scores of clinics by types were compared.

Clinic supervisors' evaluation

The township health centre serves as a supervisor of village clinics and receives referrals from village clinics. It was argued that medical professionals in township health centres are in the best position from the point of view of supervisors to evaluate the relative quality of village clinics in a township. A clinic was therefore evaluated by five medical doctors from the township health centres, representing different professional fields. In the survey, the township doctors were required to assess quality of village clinics with a rating scale (from 1 to 5, with 1 representing the poorest quality and 5 the best). The average of ratings for each clinic divided by the full rating, 5,

was the score of relative quality of a clinic. Averages of the scores of the four clinic types were then compared.

Measurement of willingness to provide preventive care

The heads of clinics were interviewed by investigators with a question: 'What is the minimum amount of subsidy you would like to request for providing a package of preventive services to the people of the administratively covered area?' Two service items were defined in the service package: planned immunization services and health education. The health education activity included was a 30-minute broadcast every month to introduce health knowledge to villagers using the village broadcasting system. The amount of money requested was used as a proxy of willingness to provide preventive services. Because the population numbers covered by clinics vary, the measurement of the willingness to provide was defined as the requested subsidy per capita, which is:

$$WTPR = X/POP$$

where, WTPR is the willingness to provide preventive services; X is the requested amount of subsidy for providing preventive services to the covered population; and POP refers to the size of population within the covered geographic area.

Measurement of over-treatment

For measuring over-treatment, a hypothetical case was prepared by medical experts for the health workers in study clinics to prescribe drugs. The case was stated as 'A patient with influenza, male, 40 years old, one-day fever with 38°C, stuffy nose and snivel, and normal in tonsil, is visiting you. Please prescribe drugs for 3 days according to the diagnosis and symptoms of the provided case based on your usual practice.' After data collection, the investigators calculated 'expenditure' for the prescribed drugs for each prescription based on the 1997 price schedule. To work out the standard range of expenditure, a panel of five medical doctors was invited to prepare a treatment protocol ranging from minimum appropriate prescription (treatment of symptoms) to maximum appropriate prescriptions (treatment of symptoms, plus prevention of infections). The range of expenditure was then accounted based on the treatment protocol. It ranged from 0.4 to 6.0 Chinese yuan. If the cost of a prescription was less than 0.4 yuan, it implied under-treatment. On the other hand, if a drug prescription cost more than 6 yuan, over-prescription of drugs was implied. For example, if the cost of a prescription was 12 yuan, the amount of over-treatment would be 6 yuan.

Results

Characteristics of clinics and their health workers

There were 208 health workers in 109 village study clinics, an average of 1.9 health workers per clinic. On average, a clinic was equipped with 12.5 pieces of medical equipment with a minimum value of 1000 yuan, and had 10 660 yuan of recurrent fund. According to regulations issued by the Ministry of Health (Ministry of Health 1990), three rooms in a clinic were

required respectively for diagnosis, treatment and observation, and drug dispensing. In this study, all of the clinics reached the standard. On average a clinic covered a population of 1477 (see Table 1).

As shown in Table 1, 76.42% of health workers in village clinics had not been educated in formal medical institutions. Most commonly, before health workers started to practice in village clinics they received only a short period (4.7 months on average) of training in township or county level hospitals. Some of them had received retraining, but the arrangement of retraining activities was not regularly undertaken. On average, a health worker had 25 years of experience in medical practice.

Comparison of service quality

Among the 109 village clinics, there were 23 private clinics (21.1%), 30 private dominant clinics (27.5%), 32 public dominant clinics (29.4%) and 24 public clinics (22.0%). Individual indicators of quality, including capital inputs in clinics and educational background and medical training of health

workers, did not differ according to clinic ownership status (see Table 2).

Results of variance analysis comparing the quality of clinics for the four selected indicators are summarized in Table 3. Summarized scores for assessing the quality of health workers of the four clinic types were 1.031, 1.022, 1.041, and 1.030, respectively. No significant differences in score values were found (f = 0.55, p = 0.652). Averages for medical equipment pieces were 12.5, 12.9, 11.8, and 12.2 respectively, by clinic type. Again, there were no significant differences (f = 1.91, p = 0.132). Points values reflecting working conditions were 2.5, 2.3, 2.3 and 2.4, respectively, by clinic type. No significant differences were found (f = 2.02, p = 0.115). Finally, results of the analysis of clinic supervisors' evaluation also revealed no differences in health workers' quality across the four clinic types (f = 0.75, p = 0.525).

Comparison of willingness to provide preventive care

It was found that the value of willingness to provide the package of preventive care was 0.46 yuan per person on

Table 1.   Characteristics of studied village clinics and their health workers

Characteristics	Means/proportions
Clinics	
Number of health workers per clinic	1.9
Value of buildings per clinic (RMB yuan)	17 655
Number of medical equipment pieces per clinic	12.5
Recurrent funds per clinic (RMB yuan)	10 660
Population covered per clinic	1 477
Health workers	
Average number of years of medical practice	25
% of graduates from primary school	57.67
% of graduates from high school	18.75
% of graduates from professional school including colleges	23.58
Average no. of months of medical training before medical practice	4.7

Table 2.   Characteristics of clinics and health workers by ownership status

Characteristics	Private clinics	Mixed ownership		Public clinics
		Public dominant	Private dominant	
Study clinics				
Number of clinics	23	32	30	24
Proportion of clinics (%)	21.1	29.4	27.5	22.0
Number of health workers per clinic	1.87	1.92	1.90	1.91
Number of equipment pieces per clinic	12.5	11.8	12.9	12.2
Recurrent funds per clinic (1000 yuan)	10.5	9.8	12.3	9.6
Number of rooms per clinic	3.2	3.0	3.1	3.3
Average working conditions (points)	2.5	2.3	2.3	2.4
Population covered per clinic	1 480	1 540	1 320	1 570
Health workers in clinics				
% of health workers with medical training	23.3	28.1	27.4	28.8
No. of months of medical training before medical practice per health worker	5.0	4.8	4.2	4.6
No. of years of non-medical education/worker	9.4	8.6	8.2	9.8

average. This finding implies that if a clinic was subsidized with 0.46 yuan per villager, it would be willing to provide the defined package of preventive services for the population of the catchment area. For example, if a clinic covers 1000 people, the clinic would be willing to provide the preventive services with a minimum subsidy of 460 yuan a year (0.46 yuan × 1000 population covered).

The comparison of the willingness to provide preventive services found that while an average of 0.59 and 0.61 yuan per capita were requested by private clinics and private dominant clinics for providing preventive care, 0.23 and 0.41 yuan were requested by the public and public dominant clinics (see Table 4). Because the values of WTPR were not normally distributed (w = 0.4772 and p < 0.0001 in normal distribution test), a non-parametric rank-sum test was employed to examine if differences in values of WTPR existed between the clinic groups. Table 4 summarizes the results of the test. Values of WTPR among the various clinic groups on the whole are statistically significant ($\chi^2 = 13.04$, p = 0.0045). The test of differences in values of WTPR between any two village groups showed that the mean value of WTPR of private clinics was greater than that of public and public dominant clinics (p < 0.05). No difference was found between private dominant clinics and any of the other clinic groups.

The greater the values of WTPR, the less a clinic is judged willing to provide preventive care. The result therefore suggests that private clinics seemed to be less willing to provide preventive services than public and public dominant clinics. However, a detailed examination showed that this was not the case. As shown in Tables 1 and 2, the average asset value of a clinic was more than 40 000 yuan [17 600 yuan for building + 10 600 yuan for recurrent funds + (1000 yuan per piece of equipment × 12.5 pieces of equipment)], and there was no difference in assets between public and private clinics. Public clinics enjoyed the utilization of these assets free of charge, in addition to the possible direct subsidies for compensation of health workers. What this means is that a public clinic indirectly received a subsidy of 2000 yuan (40 000 yuan × 5% discount rate) from using the public assets, which was much more than the amount requested by a private clinic (0.59 yuan for a person × 1482 persons for a private clinic = 873 yuan) or a private dominant clinic (0.61 yuan × 1540 persons = 939 yuan). It is clear that this was the main reason to explain why public clinics requested less than the private clinics. Thus, it is untenable to say that private clinics were less willing to provide preventive services than their public counterparts.

Comparison of over-treatment

The average expenditure per prescription for the hypothetical case was 15.2 yuan, in which 9.2 yuan was due to inappropriate prescription or over-treatment. Over-treatment as a percentage of the total cost of treatment was 60.5%. Data analysis also showed that of the 208 prescriptions, only one was less than 0.4 yuan. Fifty-five prescriptions, accounting for 26.44% of total prescriptions, cost from 0.4 to 6 yuan; the remaining prescriptions were more than 6 yuan. Nearly 75% of the total drug prescriptions recommended drugs that were thought by panel doctors to be unnecessary. The results indicate that, overall, village clinics were more likely to over-treat than to under-treat.

Table 3. Mean values of scores of the four quality indicators by clinic type and results of variance analysis

Types of clinics	Mean values of scores			
	Quality of health workers	Amount of equipment	Working conditions	Supervisors' evaluation
Private clinics	1.031	12.5	2.51	3.42
Mixed ownership – private dominant	1.022	12.9	2.28	3.51
Mixed ownership – public dominant	1.041	11.8	2.34	3.38
Public clinics	1.030	12.2	2.40	3.47
Total	1.033	12.5	2.36	3.45
Variance analysis				
Values of f	0.55	1.91	2.02	0.75
Values of p	0.652	0.132	0.115	0.525

Table 4. The willingness to provide (WTPR) preventive services of different clinic groups and the results of the rank-sum test

Clinic groups	Mean values of WTPR	Sum of scores	Expected scores under Ho	SD under Ho	Mean score
Private clinics	0.59	1 672	1 265	134	72.7
Mixed ownership – public dominant	0.61	1 885	1 760	149	58.9
Mixed ownership – private dominant	0.41	1 348	1 650	146	45.0
Public clinics	0.23	1 089	1 320	136	45.4
Results of rank-sum test	$\chi^2 = 13.04$		p = 0.0045		

Table 5 shows the means of over-treatment expenditure (the cost for prescribed drugs over the maximum expenditure of 6 yuan) by various clinic groups and the results of statistical analysis testing the difference in the means between clinic groups. Average costs of over-treatment per prescription were 3.63, 10.49, 9.90 and 10.22 yuan for private, private dominant, public dominant and public clinics, respectively. Standard deviations within the groups indicated that large variations existed in drug prescription by village doctors. Because values of prescriptions were not normally distributed, a non-parametric rank-sum test was used. The results showed that there was no statistically significant difference in values of prescriptions between the various clinic ownership types, although over-treatment expenditure of public clinics was 2.5 times that of private clinics. This finding suggests that there was very large variation in the amount of drug prescription for the same health conditions, but it is hard to say if the variation was associated with the ownership of clinics.

Discussion

Previous studies on the assessment of quality of primary health care in China (Center for Health Statistics 1994; Network for Training and Research in Health Economics and Financing 1998) and other developing countries (Gilson et al. 1993; Peabody et al. 1994; Kanji et al. 1995; Niksic and Masic 1998) have either measured the three dimensions of quality – structure, process and outcome – separately or measured only one dimension of the three. Because data, including medical records and other related documents, were very limited in the village clinics, and the village clinics are very small with one to two health workers and simple medical equipment, complicated methods were not suitable for quality assessment in this study. Thus four indicators of clinic quality were selected: quality of health workers, amount of equipment, working conditions and clinic supervisors' evaluation. These indicators, which can indicate the most important profiles of service quality of village clinics, could be directly observed and measured in the survey.

The comparison of quality in private and public clinics in the rural areas of Shandong Province showed no differences between the two. However, the demand side of the quality assessment (patient satisfaction) was not explicitly included in this study and health status was excluded due to unavailability of data in rural settings. The comparison of all selected individual indicators (especially quality of health workers) did not show any difference between private and public clinics.

Research results also indicated that quality of care provided by village clinics was lower than required by the government simply because the health workers were not well trained (only several months training before entering practice) and continuing education was seldom undertaken. The results of quality assessment and comparison support the views that the quality of services provided by village clinics is low (Network for Training and Research in Health Economics and Financing 1998) and private village doctors provide the same quality of services as public ones (Xu 1995). The study can not provide any support for the statement that private clinics are likely to provide poorer quality services than public ones (Nanquan County Government 1983; Lin and Ma 1990).

While there are many willingness-to-pay studies (Ellison et al. 1994; Walraven 1996), willingness-to-provide studies are rare. Amongst the few studies which address this issue (Zelnio et al. 1984; McCann 1997; Stringer et al. 1999) all provide questions in their questionnaires asking whether providers are willing to provide or not, rather than acquiring the minimum level of payment at which they are willing to provide. This study was inspired by the willingness-to-pay studies, in which consumers are asked about the maximum amount of money they would be willing to pay for a specified service or a defined package of services. The heads of the clinics were asked about the minimum amount of subsidy they would require in order to provide the defined preventive services within their administrative area.

In addition to the clear definition of services which is of key importance for the validity of this measure, the age distribution of the defined population area is also an important factor, because the percentage of children among the population will determine the quantity of immunization services required. By reviewing population statistics, it was found that the ratios of children under 5 years of age to the whole population were very similar across townships (Shandong Department of Statistics 1998). Thus, it appears that the measurement of willingness to provide preventive services is reliable.

The concern of this study was that private village doctors were supposed to be more money oriented, and hence might request more for providing the same package of preventive services. While superficially we observed this phenomenon, detailed scrutiny found that this was not the case. Public clinics were subsidized directly in the form of pecuniary compensation for health workers (although not explicitly for

Table 5.   The comparison of expenditures due to over-treatment by different clinic groups and results of rank-sum test

Clinic groups	Mean values of treatment (RMB yuan)	Sum of scores	Expected scores under Ho	SD under Ho	Mean score
Private clinics	3.63	2 553	3 135	302	85
Mixed ownership – private dominant	10.49	6 089	5 956	383	106
Mixed ownership – public dominant	9.90	6 441	6 479	393	103
Public clinics	10.22	6 682	6 165	387	113
Result of rank-sum test	$\chi^2 = 4.5546$	$p = 0.2075$			

provision of preventive services) and indirectly in the form of providing operating assets. As a return for these subsidies, public clinics were supposed to provide preventive care without additional charge to patients. Thus, the reason for the public clinics requesting less was that they were already subsidized, not that they were more benevolent than private clinics.

Review of patient records for tracer conditions is often used to measure unnecessary care (Liu and Mills 1999). However, in village clinics where medical records are rarely available, this is impossible. In this study, a clearly diagnosed influenza patient was selected as a hypothetical case that was presented to all study doctors for prescribing drug treatment. Because this disease was hardly representative of the disease profile of the rural clinics and the standard of over-treatment used in this study was subjective, the degree of over-treatment observed may be questionable. However, because the same measure was used for both public and private clinics, the difference in their observed over-treatments should reflect their relative likelihood of true over-treatment. The result that there was no significant statistical difference in over-treatment expenditure between public and private clinics was unlikely to be biased due to measurement.

The large variation in prescriptions suggests that there was a large amount of over-treatment and inappropriate use of drugs. According to Wang (1996), about 90% of the service revenue of rural clinics (including both private and public) was from drug mark-up, which was about 15–30% of the whole sale prices – a strong incentive for doctors to prescribe more and costlier drugs for their own economic benefit. Accordingly, the phenomenon of prescribing unnecessary drugs in China was thought to be very common and severe in both urban and rural areas (State Council 1997). Gu reported that in poor rural areas, drugs were not effectively used by village health workers (Gu 1996). While this study found that 60.5% of the drugs prescribed for influenza patients were thought by panel doctors to be unnecessary, a valid estimate should rely on a better selection of representative tracer diseases, the use of patient records that provide true information on patient treatment, and more valid criteria of over-treatment.

Conclusion

Methodologies for measuring service quality, willingness to provide preventive care, and over-treatment were developed in this study. These methods are useful for the assessment of rural clinics in developing countries, where patient records and data are rarely available, and data have to be collected through investigators' field observations and face-to-face interviews. Using four indicators that are observable and measurable to assess service quality was found to be effective for comparing the quality of different types of primary care providers. The method of measuring the willingness to provide a defined package of preventive services was tested in the study. It is useful for estimating the subsidy level at which providers are willing to provide these services, and comparing the difference in willingness to provide by different types of providers. The hypothetical case method was used to test the degree of over-treatment, due to lack of recorded data. While

the validity of this method is questionable due to the possible distance between hypothetical treatment and real treatment, and due to the representativeness of the tracer disease, it was recognized as valid to compare the difference in likelihood of over-treatment by different providers.

Findings from this study provide evidence against the views that private clinics are likely to provide services with a lower level of quality than their public counterparts, that private clinics are less willing to provide preventive services, and that private clinics are more likely to provide over-treatment for their own economic benefit. The results showed that there were no differences in health service quality among the different types of village clinics. Although statistically there was a difference in willingness to provide preventive services between private and public clinics, with the former requesting more subsidy for provision, more scrutiny found that the difference was only a false appearance because public clinics were already heavily subsidized, and the subsidy they received was more than the amount requested by private doctors. The results showed no sound evidence to say that private clinics are less willing to provide preventive care. In terms of the likelihood of over-treatment, we found that private clinics were equally likely (if not less likely) to provide over-treatment as compared to public clinics.

The lack of differences in the quality of care and the likelihood of over-treatment between private and public clinics does not mean that quality of care is high and prescription behaviour is not problematic. In fact the reverse is true. Given the observations of sample clinics, the low level of medical education, and lack of continuing education of health workers, the overall quality of rural clinics definitely needs to be improved. The existence of economic incentives for doctors to over-prescribe, and the extent of inappropriate prescribing found, suggest that there is a large potential to improve the efficiency of drug utilization. Based on the findings of this study, the quality of care of rural clinics and the prescription behaviour of rural doctors are not expected to be improved by a ban on private practice, and the subsidization of private clinics to provide preventive services will increase access to primary care for the rural population.

References

Bitran R. 1995. Efficiency and quality in the public and private sectors in Senegal. *Health Policy and Planning* **10**: 271–83.

Center for Health Statistics, Ministry of Health. 1994. *Report on national health service survey 1993* (Chinese). Beijing: Ministry of Health.

Department of Medical Service Administration of Ministry of Health. 1993. *Requirements for Village Clinics for Clinics Grading System*. Beijing: Ministry of Health.

Ellison P, Marr J. 1994. Willingness to pay for unfunded health services in a family practice clinic. *Leadership in Health Services* **3**: 14–7.

Fei YZ. 1988. Advantages and disadvantages of privatization of village clinics. *Chinese Rural Health Administration* **5**: 39–40 (Chinese).

Gilson L, Kitange H, Teuscher T. 1993. Assessment of process quality in Tanzanian primary care. *Health Policy* **26**: 119–39.

Gu et al. 1996. *Study on health insurance system in rural China*. Baijia Publishing Company (Chinese).

Hou M. 1990. Evaluation of drug quality provided by private clinics. *Chinese Health Service Management* **3**: 165–7.

Jing X. 1994. *Guidelines of Medical Practice for Emergency Cases.* Beijing: People's Medical Publishing House (Chinese).

Kanji N, Kilima P, Lorenz N, Garner P. 1995. Quality of primary outpatient services in Dar-es-Salaam: a comparison of government and voluntary providers. *Health Policy and Planning* **10**: 186–90.

Lin SY, Ma XM. 1990. Problems and strategies for regulating private-owned-and-run village clinics. *Chinese Health Economics* **6**: 58–60 (Chinese).

Liu G, Liu X, Meng Q. 1994. Privatization of the medical market in socialist China: A historical approach. *Health Policy* **27**: 157–74.

Liu X, Mills A. 1999. Evaluation of payment mechanisms: how can we measure unnecessary care? *Health Policy and Planning* **14**: 409–13.

McCann TV. 1997. Willingness to provide care and treatment for patients with HIV/AIDS. *Journal of Advanced Nursing* **25**: 1033–9.

Meng QY, Liu XZ. 1994. History and trends of developing private health sector in China. *Chinese Health Service Management* **3**: 32–5 (Chinese).

Ministry of Health. 1990. *Guidelines for assessing performance of hospitals.* Beijing: Ministry of Health (Chinese).

Ministry of Health. 1991. *Year Book of Health Statistics.* Beijing: People's Medical Publishing House (Chinese).

Ministry of Health. 1995. *Year Book of Health Statistics.* Beijing: People's Medical Publishing House (Chinese).

Nanquan County Government. 1983. Village clinics should be owned and run by village collectives. *Chinese Rural Health Service Management* **1**(Suppl): 123–12 (Chinese).

Network for Training and Research in Health Economics and Financing. 1998. *Health Care Financing and System in Poverty Areas in China.* Beijing: People's Medical Publishing House (Chinese).

Newbrander W, Rosenthal G. 1997. Quality of care issues in health sector reform. In: Newbrander W (ed). *Private Health Sector Growth in Asia.* Chichester, UK and New York: John Wiley & Sons Ltd.

Niksic D, Masic I. 1998. Quality assessment in primary health care. *Medical Archive* **52**: 147–51.

Peabody JW, Rahman O, Fox K, Gertler P. 1994. Quality of care in public and private primary health care facilities: structural comparisons in Jamaica. *Bulletin of the Pan American Health Organization* **28**: 122–41.

Shandong Department of Statistics. 1998. *Statistical Yearbook of Shandong.* Chinese Statistical Publishing House (Chinese).

State Council. 1995. *Plans on Health Sector Reform Designed by Ministry of Health.* No. 62 official document. Beijing (Chinese).

State Council. 1997. *To Improve Health Economic Policies in China.* Beijing: Chinese Economic Publisher (Chinese).

Stoddart GL, Barer ML. 1992 Toward integrated medical resource policies for Canada: II. Improving effectiveness and efficiency. *Canadian Medical Association Journal* **147**: 1653–60.

Stringer JS, Stringer EM, Phanuphak P. 1999. Prevention of mother-to-child transmission of HIV in Thailand: physicians' attitude on zidovudine use, pregnancy termination, and willingness to provide care. *Journal of Acquired Immune Deficiency Syndromes* **21**: 217–22.

Walraven G. 1996. Willingness to pay for district hospital services in rural Tanzania. *Health Policy and Planning* **11**: 428–37.

Wang X. 1996. Comments on private medical practice. *Chinese Health Economics* **3**: 24 (Chinese).

Weihai Municipal Government. 1998. Measures to well administer and control rural health market. Provincial Health Conference, Jinan, Shandong (Chinese).

Xu Y. 1995. *Assessment of Development of Private Health Practice in Heze, Shandong.* Thesis for Master Degree, Shandong Medical University (Chinese).

Zelnio RN, Nelson AA Jr, Beno CE. 1984. Clinical pharmaceutical services in retail practice. I. Pharmacists' willingness and ability to provide services. *Drug Intelligence and Clinical Pharmacy* **18**: 917–22.

Zhang Y, Wei X. 1988. Development of market economy and development of private health sector in Wenzhou, Zhejiang Province. *Chinese Health Service Management* **4**: 27–29 (Chinese).

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