Impact of a cost sharing drug supply scheme on the quality of service in public health facilities

K. A. Holloway[1]

B. R. Gautam[2]

abstract

Insufficient drug availability undermines primary health care in Nepal. This study investigated the impact of cost-sharing drug schemes (CSDS) in rural hilly E. Nepal, where the drug supply is supplemented and a nominal user fee charged, on the quality of service provided. A cross-sectional survey was conducted & WHO indicators used. It was found that the CSDS did improve drug availability and utilization rates. Further drug use was more rational in the CSDS in terms of prescribed drugs being dispensed and antibiotics being prescribed and dispensed in full course. In other respects the quality of care in CSDS was similar to non-CSDS facilities and was poor. Low staffing levels probably contributed to this. Of particular concern was the inadequate sterilization practices and sterile injection technique in most health facilities (CSDS & non-CSDS).

Keywords: cost-sharing; prescribing habits; quality of care; drug use; facility utilization, user fees.

Introduction

Insufficient funding, poor quality of care and the irrational use of drugs undermine primary health care in many developing countries including Nepal. Like many developing countries, Nepal is unable to spend the minimum US $12 per capita on primary health care recommended by the World Bank (World Bank 1993). As a

consequence, essential drugs and manpower are often insufficient at the primary health care level and contribute to poor quality of care and low utilization (Tamang & Dixit 1992). Villagers in Nepal have cited poor quality of care and distance as reasons for not using the health posts (Chalker et al 1990).

Irrational use of drugs is a world-wide problem and maybe by provider (Laing 1990, Hogerzeil et al 1993, Gilson et al 1993) or consumer (Greenhalgh 1987). Irrational drug use in Nepal (Holloway 1996, DDA/GTZ 1997) contributes to the poor quality services and wastes the drugs which are in such short supply (Holloway 1997). Since the "Bamako Initiative" was launched by UNICEF in 1987, many countries have introduced user fees for essential drugs in order to raise funds to buy more drugs and improve the quality of care. In some cases utilization increased when drug availability improved (Litvack & Bodart 1993, Fryatt et al 1994) and in other cases utilization decreased (Waddington & Enyimayew 1989 & 1990, Cumbi 1989, Holdsworth 1990).

The government of Nepal (HMGN) supplies essential drugs to health facilities once per year and these drugs, for which no charge to the patients is made, often run out after 3-5 months (MOH & MLD 1995). Thereafter patients must buy drugs at high prices from shops or do without drugs. HMGN is now planning to introduce user fees in a nation-wide revolving drug scheme programme, the Community Drug Programme (CDP), with the aims of providing year-round drug availability and promoting rational drug use (MOH & MLD 1995). There are a number of drug schemes in Nepal that have been charging user fees and using the money to supplement the annual government indent of drugs in public health facilities. These schemes have been running in different ways and are described elsewhere (Cross et al 1996). Most of these schemes have been evaluated from the point of view of financial & management efficiency. There have been few studies to assess the impact of drug schemes on the quality of care and rational use of drugs.

The aim of this study was to assess the impact of cost sharing drug schemes run by HMG MOH & the Britain Nepal Medical Trust on the quality of service and rational use of drugs in public health facilities.

The Britain Nepal Medical Trust (BNMT) is an INGO that runs, in cooperation with HMG's MOH, drug

scheme projects. One of the projects, Hill Drug Scheme (HDS), runs in private drug shops where drugs are sold to patients at cost price plus 22.5%. This scheme is described elsewhere (Holloway 1996) and will not be discussed further in this article. The other project, Cost Sharing Drug Schemes (CSDS), has been running in public health facilities in 4 hill districts of Eastern Nepal for the past 7-17 years depending on the district. In the CSDS, BNMT supplies essential drugs to the Ilaka health posts and district hospital once the annual indent has finished. In return patients are charged a small user fee (whether the drugs are supplied by HMG or BNMT) and the money collected and used by BNMT to buy more drugs. About half the drugs used by health facilities are supplied by BNMT which recovers half of its drug costs ie. HMG pays one-half, BNMT one-quarter and patients one-quarter of the drug costs.

During 1996 BNMT undertook and extensive evaluation of its drug schemes and as part of this evaluation a comparison was made between CSDS health facilities and non-CSDS health facilities. It is this comparison which is reported in this article. Within the CSDS there are actually 3 schemes differing in terms of the district & the type of user fee charged. The details of these fees are described elsewhere (Holloway & Gautam 1997). However, all the fees resulted in each patient paying on average a total of Rs. 7/- for drugs in all the CSDS facilities. In most CSDS & non-CSDS health facilities each patient also paid a Rs. 2/- registration fee. The point of this paper is to compare CSDS (supplementary drugs & a nominal fee for drugs) with non-CSDS (no supplementary drugs & no fee for drugs) and not the different CSDS fee systems, which have been compared elsewhere (Holloway & Gautam 1997). A fee of Rs. 7-9/- (including the registration fee) is very nominal being less than one-third of the average day's cash income reported in one study to be Rs. 23/- for 79% of households (Kafle & Gartoulla 1993).

Method

The study took place in 36 CSDS health facilities (33 Ilaka health posts & 3 district hospitals) in 3 districts and 16 non-CSDS health facilities (14 health posts & 2 district hospitals) in 7 districts. Although the non-CSDS facilities were spread over 7 districts (14 facilities in 5 non-CSDS districts & 2 facilities in 2 CSDS districts) the analysis treated them as one "district" or group. The study design was a cross-sectional survey done over a period of 5 months in early 1996. All CSDS facilities were selected. The non-CSDS facilities that were nearby HDS shops (that were studied during the evaluation) were selected.

At each health facility, the following data collection activities were done:

1. a consecutive sample of 15-30 exiting patients, who had been prescribed and dispensed one or more drugs and who were 12 years of age or more, were interviewed;

2. health facility records were examined;

3. stock checks were done;

4. 30 consultation and 30 dispensing episodes were observed;

5. a minimum of 120 carbon copy prescriptions (30 per month for 2 dry winter and 2 wet summer months) were examined.

Nine interviewers were trained for 1 month and supervised by 3 team leaders who were BNMT staff. The authors supervised activities every 2 weeks in the field. Data was entered into Epi-Info which was used for simple analysis. WHO rational drug use and quality of care indicators were used (WHO 1992, WHO 1993). Analysis was usually done at the level of the health facility. However in the case of the interview data, analysis was done at the level of the patient since the number of interviews at some facilities was only 15 and this was considered too low to give valid results at the health facility level. The level at which the analysis was done is indicated in the results section.

Results

The results section is divided into 2 sections addressing:

1. quality of the services provided in terms of utilization, drug availability and staffing patterns.

2. quality of care in terms of the consultation and dispensing processes and the rational use of drugs.

Quality of the service provided

Health facility utilization rates are shown in table I. The numbers of out-patient (OPD) visits over a period of 4 months (2 wet summer & 2 dry winter months) were counted in the patient registers. In terms of the number of out-patient visits (which indicates health facility workload) utilization was either greater or the same in CSDS facilities as non-CSDS facilities. However if the catchment population density is considered, ie. out-patient visits as a % of the population, then utilization was greater in all the CSDS facilities as compared to the non-CSDS facilities within the study and also as compared to HMG statistics.

Some indicators of socio-economic status of the patients attending the health facilities is shown in table II. Educational level and land ownership was higher in users as compared to the general population although there was no difference between CSDS and non-CSDS facility users. People using hospitals appeared to have greater educational level, literacy, land ownership and access to sanitation than those using HPs. The number of women and children utilizing facilities was relatively low but there was no difference between the CSDS and non-CSDS facilities.

Table I: Utilization rates in 1995.

Indicator (Health	*CSDS*			*Non-CSDS in*	*Non-CSDS in*
facility records)	*BDS5 N=11*	*PDS5 N=12*	*TDS5 N=10*	*HDS5 areas N=16*	*E. Region (HMG statistics)*
OPD visits/health facility/4 months3					
* HP	1280	700	586	689	480-5951
* Hosp	4781	3536	2791	3446	
Annual OPD visits district-wide as % of population4	28.5	20.6	24.6	16-182	18.81

1 Annual Report of Dept. Health Services Eastern Region 2051/2, HMG MOH Eastern Regional Directorate.

2 Estimated for 16 facilities over 5 hill non-CSDS districts.

3 Average per facility during the months of Mangsir, Pous, Jesth & Asar was estimated from N facilities.

4 Analysis was done at the level of the patient & not the health facility ie. the total attendance district-wide in all facilities is compared with the district population.

5 BDS=Bhojpur (2-band item fee); PDS=Panchthar (Flat fee); TDS=Taplejung (1-band item fee); HDS=Hill Drug Scheme, where BNMT supports private drug retail shops.

N Number of health facilities whose records were examined

Table II: Socio-economic status.

Patient Characteristics3	*CSDS*			*Non-CSDS4*	*General*
(Interview Data)	*PDS4 n=328*	*TDS4 n=330*	*BDS4 n=341*	*n=467*	*Population HMG stats.*
% < 5 years	17	16	15	18	151
% Female	43	42	49	49	501
% Tribal	60	57	54	45	>461
Average family size	6.9	7.1	6.8	6.9	5.42
% Literacy	39 HP 43 Hos	49 HP 55 Hos	44 HP 69 Hos	43 HP 51 Hos	451
% < School Leaving Certificate	92 HP 83 Hos	86 HP 86 Hos	92 HP 76 Hos	93 HP 83 Hos	982
% < 1 hour access	57	62	45	61	-
Landowners: % owning land av. plot size (ropani)	 95% 30	 94% 39	 98% 24	 98% 29	 82%1 221
% in agriculture	84 HP 64 Hos	85 HP 71 Hos	84 HP 73 Hos	79 HP 73 Hos	911
% patients: < 30 mins to water using a latrine	 88 59 HP 81 Hos	 92 61 HP 61 Hos	 84 39 HP 55 Hos	 87 49 HP 62 Hos	 - -

1 Statistical Year Book of Nepal 1995 HMG NPC Bureau of Statistics.

2 Statistical Pocket Book of Nepal 1992, HMG NPC Bureau of Statistics.

3 Analysis done at the level of the patient not the health facility.

4 BDS=Bhojpur (2-band item fee); PDS=Panchthar (Flat fee); TDS=Taplejung (1-band item fee).

n Number of patients interviewed.

Drug availability was measured by doing stock checks during supervisory visits done on average 3 times per year. A stock check in non-CSDS facilities could only be done once approximately 2-6 months post indent. Table III summarises drug availability. The numbers for Procaine Benzyl Penicillin & Cotrimoxazole represent the risk of these drugs being absent during a supervisory visit. For example, cotrimoxazole was out of stock on average in 3 out of 10 non-CSDS facilities during any one visit ie. the risk of stock-out was 0.3 or 30%. There were fewer therapeutic groups absent and less risk of cotrimoxazole or procaine benzyl penicillin injection being absent in CSDS as compared to non-CSDS facilities.

Staffing patterns were measured by examining the staff attendance register at each health facility. The months of Jesth, Asar, Mangsir & Pous were looked at. Table IV shows the number of days in every 100 working days without prescribing staff. Thus the numbers in the table could also be regarded as the % of working time without prescribing staff. One CSDS district (Taplejung) had more staff absences than the others but this problem had existed for some years previously. Staff absences in non-CSDS health facilities were similar to those in CSDS facilities.

Table III: Drug availability at the health facilities in 1995-6

Drugs out of stock, on average,	*CSDS*			*Non-*
during any one visit1	*BDS4*	*PDS4*	*TDS4*	*CSDS2*
No. therapeutic groups (out of 13 groups)3	1.3	1.3	1.3	3.2
Cotrimoxazole tablets	0.09	0.05	0.07	0.3
Proc.Benz.Penicillin inj.	0.02	0.09	0.1	0.2

1 Analysis was done at the level of the health facility.

2 A stock check was only done once for non-CSDS facilities 2-6 months post-indent.

3 Drugs were divided into 13 therapeutic groups as follows: antibiotics, procaine benzyl penicillin (PPF) injection, cotrimoxazole, eye ointment/drops, benzyl benzoate, whitfield ointment, oral rehydration salt, intravenous fluids, analgesics, anti-helminthics, metronidazole, iron/folic acid & antacid.

4 BDS=Bhojpur (2-band item fee); PDS=Panchthar (Flat fee); TDS=Taplejung (1-band item fee).

Table IV: Staffing patterns in the health facilities in 1995.

No. days per 100 without staff1	*CSDS*			*Non-CSDS*
	Bhojpur	*Panchthar*	*Taplejung*	
HA/SAHW Senior prescriber	79	76	99	91
AHW/ANM2 Junior prescriber	35	21	40	26
HA/SAHW/AHW/ANM All prescribers	24	20	40	26

HA: Health Asst.; (S) AHW: (Senior) Auxiliary Health Worker; ANM: Aux. Nurse Midwife.

1 Analysis done at the level of the health facility.

2 Figures exclude the district hospitals where there was never any total absence of junior prescribers.

Providers' quality of care

Table V summarises the quality of patient care at the health facilities. The overall quality of care was poor. Each patient was seen in about 4-5 minutes and about one-third of them were not examined. There was no interaction (discussion) between dispenser and consumer in two-thirds of dispensing episodes and about one-third of patients did not know their dosing schedules immediately on exiting from the health facility. Only a minority of health facilities were following adequate sterilization procedures and sterile injection technique.

Table V: Provider's quality of care.

WHO Indicator (Observation	*CSDS*			*Non-CSDS*
and Interviewing)	*Bhojpur*	*Panchthar*	*Taplejung*	
Consultation1: *** Average time (mins)**	4.7	6.6	4.5	4.5

*** % with no exam**	24%	21%	31%	36%
Dispensing1&2: *** Average time (mins)**[1]	2.3	3.1	2.5	1.7
* % episodes with:				
- no instruction1	7%	9%	7%	15%
- no interaction1	74%	49%	64%	74%
- dispensing errors2	7%	11%	5%	13%
* % prescribed items dispensed3	82%	81%	88%	54%
Patient knowledge4: **% patients knowing dosing schedule**	65%	67%	69%	69%
Sterilization practices5: **% HPs that:**				
*** boil for 20 mins**	23%	42%	33%	36%
*** use separate needles**	54%	55%	90%	70%
*** use separate syringes**	8%	18%	40%	0%

1 At least 30 episodes were observed for each health facility (36 CSDS & 16 non-CSDS) and analysis done at the level of the facility.

2 Analysis was done at the level of drugs dispensed to the interviewed patients. Those drugs for which no judgement could be made whether there had been a dispensing error or not were excluded. Sample sizes were 489 for BDS, 595 for PDS, 366 for TDS & 504 for non-CSDS.

3 Analysis was done at the level of drugs prescribed and dispensed to the interviewed patients, sample sizes for prescribed drugs being 688 in BDS, 776 in PDS, 497 in TDS and 1014 in non-CSDS. Since dispensed drugs, for which it was impossible to judge whether there had been a dispensing error, are included here the sample sizes are different from those above.

4 Between 15 to 30 patients were interviewed at each health facility (36 CSDS and 16 non-CSDS) and analysis done at the level of the facility.

5 Each facility's sterilization practices were observed once and analysis done at the level of the facility.

Quality of care was similar in CSDS and non-CSDS facilities although it appeared that dispensing practices were slightly better in CSDS facilities. The longer dispensing time in CSDS facilities was probably related to the larger number of items dispensed as compared to non-CSDS facilities. However, the % episodes with no instructions given to the patient and no interaction between dispenser and consumer and the number of dispensing errors were all higher in non-CSDS as compared to CSDS facilities. The % of prescribed drug items dispensed was significantly less in non-CSDS as compared to CSDS facilities where there was a supplementary drug supply. Labelling of dispensed items was not observed in any facility.

Prescribing habits are shown in table VI. Variation between the CSDS districts is due to the different user fees operating in the different districts and has been described elsewhere (Holloway & Gautam 1997) using more extensive data. In particular the flat fee (PDS) is associated with much greater drug use (which is irrational) than the item fees (BDS & TDS). The data in this study is less extensive and is designed to compare CSDS (year-round drug availability) and non-CSDS health facilities (drug availability for 3-5 months only). As can be seen from table VI fewer items and less antibiotics and injections were prescribed in non-CSDS as compared to CSDS health facilities. Of particular significance from the point of view of rational drug use was the fact that the % of antibiotics that were prescribed in full course in non-CSDS was low and only about half that in CSDS health facilities.

Table VI: Providers' prescribing habits.

WHO Prescribing Indicator	*CSDS*			*Non-*
(Observation & Interviewing)	*BDS3*	*PDS3*	*TDS3*	*CSDS*
Average number of items prescribed1	2.0	2.7	1.8	1.5
% patients prescribed antibiotics1	46%	66%	50%	28%
% patients prescribed an injection1	15%	20%	14%	10%
% antibiotic drugs that are prescribed in full course2	85%	67%	84%	45%

1 The records of at least 120 patient episodes (carbon copy prescriptions in CSDS and entries in the patient register in non-CSDS during the months of Mangsir, Pous, Jesth and Asar) were examined for each health facility and analysis done at the level of the facility, sample sizes for facilities being 11 for BDS, 10 for TDS, 12 for PDS and 16 for non-CSDS.

2 Since the patient registers in non-CSDS facilities did not include details concerning the number of tablets/capsules etc. that were prescribed, the prescriptions of interviewed patients were used. The antibiotics looked at were cotrimoxazole, tetracycline and procaine benzyl penicillin, these 3 antibiotics covering most of the antibiotic usage. Analysis was done at the level of the prescribed drug, sample sizes being 131 for BDS, 111 for PDS, 81 for TDS and 85 for non-CSDS.

3 BDS=Bhojpur (2-band item fee); PDS=Panchthar (Flat fee); TDS=Taplejung (1-band item fee).

Conclusion

The overall utilization rates in both CSDS and non-CSDS facilities were very low being less than the 2 visits per person per year estimated as necessary in primary health care by World Bank (1993). Further, the socio-economic status of the facility users appeared to be slightly higher (especially in hospitals) than that of the general population. Thus access appears low, the majority of people not using HPs or hospitals. Nevertheless, the CSDS facilities in comparison with the non-CSDS ones were associated with greater utilization by patients despite the charging of nominal user fees. The reasons for low utilization may include distance, poor quality of care and expense (Chalker 1992, Cumbi 1989, Holdsworth 1990). However, since the socio-economic status of the patients was the same in both CSDS and non-CSDS facilities, it seems that the nominal user fees charged in the CSDS did not cause any decrease in access.

Drug availability was significantly better in CSDS facilities compared to non-CSDS ones. This is not surprising since the CSDS facilities all received a supplementary drug supply and non-CSDS ones did not. Since the CSDS and non-CSDS facilities were similar in all other respects it is likely that greater utilization in CSDS was associated with the better drug availability. Staffing levels were very low in all facilities. The absence of any prescribing staff 20-40% of the time is likely to have contributed to the poor quality of care and low utilization rates observed despite the good drug availability in CSDS facilities.

Although the dispensing process appeared slightly better in CSDS facilities, the quality of care was poor in all facilities. The large number of patients not knowing how to take their drugs immediately on exiting from the facilities is likely to be related to the poor dispensing process. If such a large number of patients did not know how to take their drugs immediately on exiting facilities, how much larger a number did not know after 1 hour or 1 day ? At best many drugs that could ill be afforded were wasted through poor patent compliance. At worst many patients suffered from over and under-dosing of drugs with possible serious consequences. The inadequacy of the sterilization practices and sterile injection technique in the majority of health facilities was a very worrying finding especially in the present context of spreading HIV/AIDS. There appeared to be little difference between CSDS and non-CSDS facilities despite intermittent training on sterilization and sterile injection technique given to health staff in the CSDS.

Some staff were aware of recommended procedures but said they did not follow them because of a lack of kerosene for boiling and/or a lack of syringes. The latter was not valid in the case of CSDS since they could order as many syringes as necessary. Despite lack of kerosene or syringes injections were often prescribed when oral medication would have been equally appropriate. Thus it seems that many health workers have not understood and believed the dangers of poor sterilization an sterile injection technique.

More drugs were prescribed in CSDS as compared to non-CSDS facilities. Whether this is more or less rational overall cannot be judged from this study but is similar to the findings of a previous study which showed that good drug availability with low "flat" user fees was associated with irrational over-use of drugs (Chalker 1992). It is likely that just as there was irrational over-use of drugs in the CSDS, especially in the flat fee district, (Holloway & Gautam 1997) equally there was "irrational" under-use of some drugs in non-CSDS. However, the CSDS did appear to have a large positive impact in the use of antibiotics probably because of better drug availability. In the CSDS facilities most antibiotics were both prescribed and dispensed in full course but in the non-CSDS less than half of all antibiotics were prescribed in full course and of those prescribed in full course half were not dispensed in full course. The taking of incomplete courses of antibiotics is very serious and likely to lead to antibiotic resistance.

In summary the CSDS did lead to improved quality of care in terms of drug availability which in turn led to improved utilization. Patients were willing and able to pay a nominal fee for drugs. Provider drug use also appeared to be more rational in the CSDS in two aspects – (1) what was prescribed was usually dispensed unlike non-CSDS, (2) antibiotics were usually prescribed and dispensed in full courses unlike non-CSDS. In both CSDS and non-CSDS facilities poor staffing levels undermined the quality of care which in turn is likely to have contributed to low utilization. There is an urgent need to improve the dispensing process and patient knowledge concerning dosing. There is also urgent need to improve sterilization practices and sterile injection technique and reduce the number of injections being prescribed and dispensed.

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