
Availability of essential drugs and sustainability of village revolving drug funds in remote areas of Lao PDR

Lamphone Syhakhang, Sivong Sengaloundeth, Chanthakhath Paphassarang,
Solveig Freudenthal and Rolf Wahlström

Abstract

We used a cross-sectional design to assess the availability of essential drugs (EDs) in remote areas in two provinces in Laos, and to explore the views on the performance and sustainability of village revolving drug funds (VRDFs) among the VRDF committees and community members. Four remote districts of Khammouane and Champasak provinces were purposely selected and five villages were randomly selected within each district. Four data collection methods were used: a) Survey of revolving drug funds and private pharmacies, b) Structured interviews with village health volunteers (VHVs), and with 400 randomly selected household heads (20 in each village), c) Checklist to assess the performance of VRDFs, and d) Group discussions with community members and VRDF committees to explore their needs, and the services and management of VRDF. We found that the average availability of 10 selected essential drugs at VRDFs was 37%. For three out of four villages the availability of EDs was higher in the village where a private pharmacy existed than in the village with only VRDF. The management system of VRDFs was weak and characterised by a lack of necessary guidelines and equipment for VHVs, no report and feedback system, no regular monitoring, and not functioning supervision. The VHVs did not have enough knowledge and experience to manage the VRDF in a better way. When a family member was sick, care was sought in the VRDFs in 29% of cases, at private providers (pharmacies, clinics) in 34% and at public health facilities in 30%.

We conclude that the low availability of good quality ED in the VRDFs seems to be due to poor management. A comprehensive

management mechanism system should be established to ensure availability of good quality drugs accessible for people in the remote areas.

Introduction

Access to essential drugs (EDs) is fundamental to the good performance of the health care delivery system. The provision of safe, effective and affordable EDs of good quality in the right quantity to the whole population in particular the poor is therefore a priority in health and drug policy (Quick 2003). The concept of Revolving Drug Funds (RDFs) was launched through the Bamako initiative to be one way of solving the problem of securing availability of medicines in resource poor settings (Umenai and Narula 1999). Although criticised for putting the burden of costs of drugs too heavily on the poor and to be difficult to manage in the long term (Uzochukwu *et al.* 2002), it has continuously been used in many low-income countries, both in Asia and Africa (Mendis *et al.* 2007). The RDF is a system whereby the revenue generated by the sale of drugs to patients is used to purchase new drugs. The aim is to provide safe quality drugs at affordable prices and is usually part of wider user-charge schemes (MoH 2001).

Laos is a low-income country with poor health indicators. Particular challenges for health care provision, including drugs, are the mountainous character of the country with many remote villages lacking good infrastructures in terms of roads and health care facilities. In Laos, 80% of pharmaceuticals are provided by the private sector (Stenson *et al.* 1997), but access to essential drugs to combat common diseases in remote areas remained low (Ministry of Health 2001).

To solve the problem of the lack of ED in public health facilities in Laos, revolving drug funds (RDFs) were established as regional pilot projects as part of a community health programme supported by non-governmental, bilateral and multilateral development assistance in the 1990s. A national drug policy (NDP) was approved in March 1993 to improve access to essential drugs and to promote more rational use of these drugs (Paphassarang *et al.* 1995). Already in the same year, the Lao government officially approved the RDF system with exemptions for civil servants and poor people. Drugs provided by the government were added into the drug stock and were targeted to be given free to those exempted from paying the user charge (Ministerial Decree no. 52 1995).

The Ministry of Health established a central RDF committee in 1994. Its major function has been to provide guidelines for the establishment and operation of RDFs in the country. In the provinces, there are four levels of RDF: provincial, district, health centre and village. At each level, there is a committee for supervising and monitoring the implementation of RDF and many health staff are responsible for running the RDF, with the exception for the village level, where a health volunteer (VHV) is the only responsible person under the supervision of the village RDF committee, which includes the village leader and representatives from different mass organizations at the village level.

In a study conducted in 1997-98 it was shown that cost-recovery was high at that time (more than 100%) in RDFs located at district hospitals and health centres in urban or semi-urban areas in Vientiane Municipality (Murakami *et al.* 2001). However, the long-term sustainability was not assessed. In the year 2000, the number of RDFs of different levels of health facilities was 1,760, of these 1,245 (11% of all 11,640 villages) were located at village level especially in remote areas with no or few private pharmacies (Ministry of Health 2001). Since 1998-99, RDFs at village level (VRDFs) have been strongly promoted by the MoH as an important component of the primary health care system. VRDFs were considered to be the main supply sources of EDs in remote areas, which are defined as villages with difficult road access, in particular during the rainy season, without electricity and without water pipe.

However, at the time of this study (March-May 2002), there was a lack of accurate information on the availability of EDs in remote areas, and the functioning and sustainability of VRDFs. The pricing principles recommend a selling price that is 25 percent higher than the buying price to accommodate for transport and administrative costs. It should also include losses due to exemptions for the poorest, and for some incentives for the VHV. It was not well known how this system functioned a few years after implementation, although there were several indications that the exemption scheme suffered from many constraints, making it imperfect as a mechanism to support the poorest.

The aim of this study was therefore to assess the availability of EDs of the population in remote areas in two provinces and to explore the performance and sustainability of VRDFs in order to provide information to the MoH for further planning and intervention. The study was undertaken

within the health systems research training (Jönsson *et al.* 2007) during the third phase of the National Drug Policy implementation project (Food and Drug Department 2003), which had been supporting the National Drug Policy since its start in 1993 (Paphassarang *et al.* 1995). Operational research was one of the elements of the revised Drug Policy.

Material and methods

STUDY POPULATION AND SAMPLING

The Khammouane and Champasak provinces were purposively selected, located in the middle and the south of Laos, respectively. Khammouane was chosen as it was assumed to have well performing VRDFs due to special support in terms of financing and training that had been provided within a special donor-funded project. Champasak was chosen to represent a province with similar general conditions, but where the VRDFs had only received the general Government support. At the time of the study, there were nine districts with 803 villages in Khammouane and fourteen districts with 914 villages in Champasak (FDD 2000). The estimated proportion of poor villages were 35% in Khammouane and 30% in Champasak (National Statistics Centre 2002/2003)

In both provinces there was one provincial hospital and in addition there were eight district hospitals in Khammouane and 14 district hospitals in Champasak. At the peripheral level there were in total 207 village RDFs in Khammouane, and 67 village RDFs in Champasak. All 274 VRDFs in both provinces constituted the study population.

In each province, two districts, representing remote areas according to the provincial authority, were purposely selected. In each district, five villages among those that had a VRDF, were randomly selected from the list of villages with VRDF. Thus, in total 20 remote villages were included from 106 villages with RDFs in the four districts of both provinces. The VRDF and any private pharmacy available in each village were visited.

In each village, twenty household heads were randomly selected from the list of all households in the village with assistance from the village leader (supplying the list and assisting the team to find the selected households), resulting in 400 households selected in the 20 villages to be included in the study sample.

In addition six group discussions were conducted, three in each province, one group for men, one group for women and one group for the RDF committee, each in a separate village. Each group included 5-10 persons.

METHODS

The study was cross-sectional, using three methods: a) survey of VRDFs and licensed private pharmacies to assess the availability of EDs, b) a checklist to assess the performance of RDF, c) structured interviews with VHVs, and household heads, and d) group discussions with community members, and with members of VRDF committees.

The survey of the VRDFs and private pharmacies was conducted to assess availability of EDs at village level using a questionnaire, which included the name of EDs, its availability, registered drug based on the list made by the Food and Drug Department, expiry date, original packaging, and unit price of each drug. To measure the ED availability, the ten most important EDs were selected from the 28 EDs allocated for VRDFs based on the list developed by UNICEF in cooperation with MoH. The selected EDs were: 1. Salbutamol, 2. Ferrous sulfate, 3. Ampicillin, 4. Chloroquine, 5. Cotrimoxazol, 6. Mebendazol, 7. Paracetamol, 8. Penicillin V, 9. Potassium Iodide, and 10. ORS (oral rehydration salt). Availability was defined as the presence on the shelves of the selected EDs at the VRDF, during the visit of the data collectors.

A checklist was developed and used to assess the management and performance of the VRDF. The checklist included: (i) the organization of the RDF, (ii) the composition of the RDF committee, (iii) number of meetings during last year, (iv) inspections and supervisions carried out, (v) drug list, (vi) necessary equipment, (vii) drug procurement system, (viii) monitoring system for income and expenditures, (ix) reporting system, and (x) distribution of benefits.

The structured interviews with the VHVs were carried out to get information on their background characteristics, and the management and problems at the VRDF. The structured interviews with the household heads were to obtain information on drug expenditure, and utilisation of VRDF, including reasons for not using the VRDF.

The group discussions with VRDF committee members, and villagers, respectively, aimed at exploring their perceptions about availability of

essential drugs, price of drugs and the performance and sustainability of the VRDF, including the performance of the VHV.

A pretest of the questionnaires, checklist, and the guide for group discussions was conducted in Phonethong district in Champasak, followed by revisions and adjustments. The data collection was conducted in March 2002 in Champasak, and April-May 2002 in Khammouane, by five trained enumerators under supervision of the first author (LS).

ANALYSIS

Epi Info Program version 6 was used for data entering and data analysis. Frequency and cross tabulation tables were performed to obtain information on availability of drugs, drug price and management of VRDFs, as well as to obtain information on the use of the VRDFs by the households.

The six group discussions were tape-recorded, transcribed and then translated into English. The transcripts were read several times by the authors and discussed under the supervision of the fourth author (SF). The texts were summarized into matrices and tables and thereafter categorized into different sub-themes and themes.

Results

The results are presented in three sections related to the different data collection methods - (I) survey of VRDFs and private pharmacies; (II) structured interviews with a) village health volunteers, and b) household heads; and (III) group discussions with a) villagers, and b) VRDF committee members. Some topics will therefore be presented more than once. However, a synthesized discussion related to these topics will follow after the presentation of the findings.

SURVEY OF VRDFs AND PRIVATE PHARMACIES

Availability, sales and cost of ED

The availability of the ten selected EDs in Khammouane and Champasak was on average 3.5 ED and 3.8 ED, respectively (Table 1). Of these available drugs, 42% and 38% respectively were expired and unlabelled drugs, and 44% and 25% respectively did not have a correct label. The drugs that were missing or only found in a few villages in both Khammouane and Champasak were salbutamol, and penicillin V. Oral rehydration salt (ORS)

was not available at VRDFs in Khammouane, in contrast with Champasak where it was available at seven VRDFs.

Table 1. Availability of 10ED (essential drugs) in each of the ten villages (VRDFs or private pharmacies) in Khammouane and Champasak

No	ED name VRDF+Priv.Pharm	Khammouane	Champasak	Total	
		(n=10)	(n=10)		
		Freq	Freq		
1	Salbutamol	1*	0	1	
2	Ferrous sulfate	8	4	12	
3	Ampicillin	3	4	7	
4	Chloroquine	7	7	14	
5	Co-trimoxazol	6	7	13	
6	Mebendazol	3	1**	4	
7	Paracetamol	6	7	13	
8	Penicillin V	0	1**	1	
9	Potassium Iodide	0	0	0	
10	ORS	1**	7	8	
Average		3.5	3.8	7.3 (/20)	

Note: * only available at VRDF
 ** only available at private pharmacy

In the four villages with a private pharmacy, there was a serious lack of ED at the VRDFs, except for a village in Khammouane. There was, e.g., only one ED (cotrimoxazol) available in the VRDF in one village in Champasak, and only paracetamol tablets were available in one VRDF in Khammouane (Table 2).

Table 2. Number of 10ED (essential drugs) in each village in Khammouane and Champasak

No	Khammouane			Champasak		
	Name of village	Number of ED (10)		Name of village	Number of ED (10)	
		VRDF	PP**		VRDF	PP**
1	Village A	3		Village A	2	
2	Village B	3		Village B	4	
3	Village C*	7	5	Village C	5	
4	Village D	3		Village D	4	
5	Village E	2		Village E	2	
6	Village F	2		Village F	3	
7	Village G	3		Village G	4	
8	Village H*	1	4	Village H	1	
9	Village J	4		Village J*	1	8
10	Village K	4		Village K*	1	5
	Average	3.2	4.5		2.7	6.5

Note: * There are both VRDF and private pharmacy in the village

** PP= Private Pharmacy

The most sold drugs in Khammouane and Champasak were classified according to their priority mentioned by the VHVs and drug sellers. These drugs are all included in the Lao ED list. Paracetamol appears as the most sold drug in both provinces, and antimalarial drugs and drugs for diarrhoea were reported as the second most sold drugs.

The prices of the EDs varied from place to place between Khammouane and Champasak provinces. In general, the average price of drugs was higher in Khammouane than in Champasak, e.g., ampicillin was 38% more expensive in Khammouane than in Champasak, co-trimoxazol was 44% more expensive and mebendazol was five times more expensive. There were also differences in price between drugs in VRDFs and in private pharmacies. The price of co-trimoxazol and ORS in a private pharmacy was found to be 50-100 percent higher than that in the VRDF in the same village in Champasak.

STRUCTURED INTERVIEWS

Village Health Volunteers (VHVs)

A total of 20 VHVs were interviewed, one in each village. Their mean age was 37 years (range 20-57 years), and eight were women. Only one had high school education. Six were low level nurses. Their experiences in VRDF varied from one to eight years. Most of them had received VRDF training, one to four times, with each session lasting five days.

Management of VRDF

The surveyed VRDFs in both provinces were established at different years between 1994 to 2001. The initial budget amount varied from 50,000 Kips (about 70USD in 1994) to 2,239,000 kips (about 250USD in 2000), donated by international donors. The current total fund at the VRDFs had decreased considerably down to 50,000 - 1,400,000 Kips (about 6 - 155USD in 2002), compared to the initial amounts.

VRDF committees were organised in 17 of the 20 VRDFs. Generally the committee was composed of the chief of the village, a Lao Woman Union representative, a Youth representative, a Lao Front for National Construction representative, the VHV, and a security guard. It was reported that the management of the VRDFs was poor. In almost all VRDFs in both provinces, many systems were not in place, e.g., auditing, monitoring and reporting systems. Only 10 VRDFs had been inspected once by district health staff. There was no record or book-keeping for income and expenditure, no record neither for the debt, neither for the list of exempted poor patients (Table 3).

Table 3. Management of the village revolving drug funds (VRDFs)

No	Descriptions	Khammouane VRDF (n=10)	Champasack VRDF (n=10)
1	Existing Revolving Drug Fund Management Committee	8	9
2	Number of meetings during last year:		
	- Every month	2	3
	- Every three months	0	0
	- In a special case	5	7
3	Number of inspection and supervision carried out	4	6
4	List of drugs used in VRDF	10	10
5	Necessary equipment:		
	- Bicycle	3	0
	- Motorcycle	0	0
	- Refrigerator	0	0
	- Shelves for keeping drugs	10	10
	- Shelves for keeping files	0	0
6	Drug procurement		
	- by DHO	6	10
	- by HC	4	0
	- Not regular	10	10
7	Monitoring system for income and expenditures	Poor	Poor
8	Functioning reporting system	Not available	Not available
9	Distribution of benefits		
	- VRDF Committee	0	0
	- VHV	10	10

The benefits from the drug sales were distributed differently in the two provinces (Table 4). In Champasak some money was used for administration, transport, etc., but also for both the district and provincial health offices.

The procurement of drugs to the VRDF by the district health office (DHO) was not regular. The VHV had to travel to the DHO to get the drugs, but none was equipped with a motorised vehicle, and bicycles were

only available at three VRDFs in Khammouane. There was no salary or incentive for the committee, except for the VHV who would get some small money from drug sale benefits.

Table 4. Distribution of benefits from drug sale

Descriptions	Khammouane	Champasak
Incentive for VHV	80%	60%
For chief of the village	20%	0
For RDF administration	0	20%
For indigenous (transport, etc.)	0	10%
For DHO	0	5%
For PHO	0	5%

DHO = District Health Office

PHO = Provincial Health Office

Problems addressed by the VHVs

Many problems encountered at VRDFs were reported by the responsible VHVs, in particular the low availability of drugs. They also reported that the resources were not sufficient, one reason being that people did not pay for the drugs. Private pharmacies existed and were competing with the VHVs and could often offer more drugs than the VRDFs. The VHVs expressed that they did not have enough knowledge, e.g., most of the VHVs did not know how to read the expiry date of drugs.

Household heads

Interviews were carried out with 400 household heads, of whom 48% were female. In both provinces, almost all of them were farmers (92-95%), and 33% were illiterate.

There were in total 304 and 369 family members who were reported being sick in the last three months, in Khammouane and Champasak, respectively, with different health seeking behaviour. Sixty three percent of the cases in Khammouane reported using public health facilities including VRDFs, whereas only 53% did so in Champasak. However, significantly more people in Champasak (34%) said that they went to the VRDF than in Khammouane (23%), ($p=0.004$). The utilisation of private services including private pharmacy, private clinic and unlicensed practitioners was reported to be higher in Champasak (43%) than in Khammouane (24%) (Table 5).

Among a total of 673 sick family members, 203 (30%) reported reasons for not utilising the VRDF (Table 5). In Champasak the most common reason was non-availability of drugs (46%), whereas the reasons in Khammouane were divided between 'no needed drugs available' or 'no effect of drugs from the VRDF' (39%) and use of private providers (19%). When asked about the affordability of drug prices, only 14% of respondents in Khammouane and 10% in Champasak found it too expensive (data not shown in table). In contrast, only four percent did not visit the VRDF due too expensive prices, and only one respondent mentioned financial constraints as a reason (Table 6).

Table 5. Background characteristics of household heads and health seeking behaviour

Descriptions	Khammouane n=200		Champasak n=200	
	Freq	%	Freq	%
Sex				
- Women	96	48	96	48
- Men	104	52	104	52
Mean of age(range)	44 (18-70)		44 (17-75)	
Education				
- Illiterate	72	36	60	30
- Primary school	86	43	108	54
- College	35	17	25	12.5
- High school	7	3.5	7	3.5
Occupation				
- Farmers	190	95	184	92
- Workers	0	0	1	0.5
- Peddlers	3	1.5	7	3.5
- Government officer	5	2.5	0	0
- Others	2	1	8	4
Size of family				
- 1-5 members	98	49	90	45
- More than 6	102	51	110	55

Descriptions	Khammouane n=200		Champasak n=200	
	Freq	%	Freq	%
Number of sick members				
- 1-2 persons	170	88	187	94
- 3-5 persons	22	12	12	6
Health seeking behaviour	n=304	%	n=369	%
- Provincial hospital	34	11.2	43	11.6
- District hospital	33	10.9	24	6.5
- Health Centre	53	17.4	3	0.8
- Village VRDF	71	23.4	127	34.4
- TM	4	1.3	4	1.1
- Private pharmacy	36	11.8	86	23.3
- Private clinic	31	10.2	5	1.4
- Unlicensed practitioners	10	3.3	67	18.2
- Others	32	10.5	10	2.7
Types of drugs used	n=266	%	n=309	%
- Antibiotics	31	11.6	77	24.9
- Injections	95	35.7	52	16.8
- Tablets	135	50.7	189	61.2
- Traditional Medicines (TM)	23	8.6	16	5.2
- Do not know	11	4.2	35	11.3

Table 6. Reasons for not going to the VRDF

No	Reasons	Khammouane		Champasak	
		Freq n=233	% ¹	Freq n=242	% ²
1	Drugs are not available at VRDF	5	5.5	63	46.0
2	No needed drugs available	23	25.5	2	1.5
3	Using private providers	17	18.9	19	13.9
4	Not cured (drugs at VRDF were not effective)	12	13.3	5	3.6
5	VHV not available at VRDF	3	3.3	11	8.0
6	Serious illness	7	7.8	6	4.4
7	Don't know that VRDF exists	5	5.6	5	3.7
8	VHV has low experience	0	0.0	5	3.7
9	No injection at VRDF	5	5.6	6	4.4
10	Poor service at VRDF	4	4.4	4	2.9
11	Drugs at VRDF are expensive	4	4.4	5	3.7
12	Use TM	2	2.2	2	1.5
13	Financial constraint	0	0.0	1	0.7
14	No bed at VRDF	1	1.1	0	0
15	VHVs advised to go to other hospitals	2	2.2	1	0.7
16	Can self-medicate	0	0.0	1	0.7
	(More than one answer)	12	13.3	28	20.4
	Missing information	143		119	
	Total answer	90		123	

¹ Percentage of those who answered (n=90)

² Percentage of those who answered (n=123)

GROUP DISCUSSIONS

In total six group discussions were conducted, three in each province.

With community members

The first questions regarding health problems and diseases of villagers were asked to begin the session, followed by questions on health seeking behaviour, utilisation and services of the VRDF, price of drugs and opinions regarding sustainability of VRDFs.

Health seeking behaviour

Many participants discussed that the reasons for visiting other health facilities were due to many causes, for example the fact that drugs were not available at VRDF, that the health worker did not know how to diagnose and was not always available at the VRDF when needed or that no injections were available at the VRDF. A man in village B in Champasack said *“when we get sick, it’s better to go to the bigger hospital to ensure security rather than going to the VRDF where the health worker is not permanently present. He works in the rice field or in the forest, and it takes time to look for him. So the location of the VRDF seems to be very far from us although it is close.”* In addition, some participants mentioned that the health worker at the VRDF did not have enough experience and knowledge in medicine, only tablets were dispensed and only treatment for headache was given. No information on drug use was provided. *“Our health worker does not have enough experience. She is new. If she cannot cure the disease, we bring the patient to other persons in the village (unlicensed practitioners and traditional healers)”* said a woman in village A in Champasak.

However, in general the participants expressed their feeling that they were happy to have a VRDF in their village, but there were suggestions that the staff should be supplemented. *“We need two to three more health workers to be able to share responsibility and take duty turns so that different drugs are available to the same extent as at district or provincial hospitals”* said a woman in village D in Khammouane.

The villagers could come and buy drugs at VRDF at any time during day and night. The VRDF allowed debts for the poor people who could only pay for drugs later when they had money. *“This is our RDF. We can always use it although we don’t have money to pay now, we can pay later because it’s our RDF. We’ve just only signed our name. So it’s good to have it here to serve our villagers. It’s better than buying drugs in another village where we cannot sign”* said a man in village E in Khammouane.

Many villagers said that during the cultivation and harvest season, the VHV was not available at the VRDF as he/she was working at the rice field. Consequently, the villagers could not buy the drugs, and some drugs were left on the shelves and became expired. The participants from Champasak reported that mobile health practitioners and unlicensed drugsellers existed in every village, but they claimed they did not rely on their services. However, some said that medicines from private provider services were more effective

than the drugs from the VRDF.

Sustainability of VRDF

The villagers said that the sustainability of the VRDF would be possible since they already possessed the fund. If they needed some additional funding, it was also possible that the villagers themselves could contribute. To make the VRDF sustainable the villagers suggested that the existing RDF committee should be improved and the number of health workers should be increased to be able to share responsibilities. They also commented on the need for adequate training of the health worker and clear information about the VRDF services. It was important for the villagers that only necessary drugs should be bought and that the financial situation was reported openly on a regular basis.

With VRDF committee members

Two group meetings with members of the VRDF committees were conducted and several issues were discussed.

Utilisation and service

Most people who came to make use of the VRDF live in the village. They just came to buy drugs and did not usually tell their health problem. The most popular drugs were paracetamol, quinine and ampicillin. It was reported that the majority of patients were children and elder people.

The VRDF committee members both in village C in Champasak and F in Khammouane, said that there was high demand for health care treatment from villagers, but the utilisation of the RDF was low due to the low capacity of VHV. Patients tended to use private clinics at the district level, so the drugs at RDF were often not sold. The committee members noticed that most patients liked using injections and brand name drugs, which were not officially available at the VRDF according to the given list for drug use at village level.

It often seems difficult for the VHV to sell drugs from the VRDF. A VHV in Champasak who visited patients at home acting as a mobile practitioner, even said that he used injections (not on the list of drugs for village level) to satisfy patients: *“In order to make the RDF survive and make it sustainable, I have to use a strategy of providing injections to patients and at the same time I also provide them tablets from the RDF, otherwise I will not be able to*

sell these drugs”.

Most of the committee members in both villages in Champasak reported that the villagers’ participation was very good. They always came to use the VRDF because everybody understood that this was their VRDF, they had to use it to make it a good resource for their village. *“The main problem is that we don’t have drugs that they need, they don’t use the drugs that are available at the RDF. They are used to using drugs from the private providers”*, said a member of the VRDF in Champasak.

Drug price and availability

The VRDF committee members in Champasak said that providing drugs with a cheaper price could be one incentive for the villagers to utilize the VRDF. The villagers were happy because they could buy cheap drugs and because the money from drug sale did not belong to individuals but to the village. The only problem was that the VHV could not provide medicines according to the villagers’ needs. In striking contrast with this view, the committee in Khammouane expressed the opinion that some drugs at VRDF were actually more expensive than at private pharmacies. Hence people did not come to buy drugs at VRDF which led to expired drugs later on.

The committee members in both provinces said that the VHV did not have enough medical skills and experience. In addition, there was a delay in drug procurement to the RDF. In order to get the new drugs, the VHV had to write a report to be sent together with a request for the needed drugs to the committee at the district hospital. The VHV waited until all drugs were finished and then wrote the report. There was no satisfactory comprehensive management system from districts to villages. In many cases the VRDF management committee seemed not aware of the performance of the VRDF.

Sustainability of VRDF

In order to provide a better service to the villagers, the committee members suggested that the VHVs get more training to upgrade their knowledge, that government should provide more drugs to the VRDF, e.g. injections, brand name drugs and some medical equipment. Drugs should be ordered and provided regularly and procurement of drugs should not be delayed until all drugs are finished. In this way the VRDF would not run out of drugs.

Discussion

There was generally a low availability of key essential drugs at village level in remote areas in both Khammouane and Champasak provinces, in particular in villages with a private pharmacy. Furthermore, the observed quality of the available drugs was sub-standard. A comprehensive VRDF management system was lacking, including delay in drug procurement, no routine reporting system and low competence of VHVs. The VRDF service was said to be of poor quality. The utilization rate was rather low but nevertheless higher than the use of other health facilities. Sustainability is questionable because of decreasing funds and the continuing problems with low ED availability.

ED availability and VRDF services

In general the availability of ED was low not only for the ten selected drugs but also for the total list of 27 items. Furthermore, the quality of the drugs could not be assessed since few drugs were registered, many of them did not have correct labels and many had already expired or were unknown drugs. The situation was more serious in Khammouane than in Champasak, which was in contrast to our assumption, i.e. Khammouane was selected due to presumably well performing VRDFs there compared to Champasak. After the end of the donor support, a new scheme was set up in Khammouane. VRDFs were from then on under the supervision of provincial and district health department, which allowed the VHVs to buy medicines through the Health Centre (HC) or District Health Office (DHO). However, the DHO or HC did not receive any incentive as in Champasak. The incentive system could be one factor explaining why the situation in Khammouane became worse than in Champasak. However, this study cannot fully answer the question why this difference existed. The low availability of EDs is in contrast to what was found in Vientiane Municipality in an earlier phase (1997-1998) of VRDF introduction in the country (Murakami *et al.* 2001). In the same study the cost recovery rate was satisfactory (slightly more than 100 percent), a figure that is far removed from the situation in the VRDFs investigated in the remote areas in Khammouane and Champasak provinces. This kind of initial positive impact has been seen also in rural areas (Bigdeli *et al.* 2004), but is usually not sustainable.

The main reasons for low utilization of VRDF were the lack of ED, the fact that needed drugs were not available at VRDF, that people used private health providers, or that the VHV was not available at VRDF, and that for the more serious cases people always used other health facilities since they were afraid that they might not be cured by using drugs from the VRDF.

The reasons that many available drugs were expired in both provinces are the following: some of them were expensive, they were not the drugs needed by people or did not deal appropriately with the diseases of the season. Some VHVs had just left drugs in the VRDF waiting for the DHO staff to bring them back. The figure of drugs without correct labels was much higher than in a previous study in private pharmacies in Savannakhet (Stenson *et al.* 2001a; Stenson *et al.* 2001b). The management in charge of the drugs in the VRDFs was much poorer than in private pharmacies where regular inspections were carried out (Stenson *et al.* 2001b).

This study has not focused on the execution of the exemption policy, but on other factors contributing to inadequate functioning of the VRDFs. Our findings are in line with previous observations in urban areas (Paphassarang *et al.* 2002), notably that the exemption policy has several weak points and does not function very well in practice. However, very few people seem to abstain from using the services of VRDF due to financial constraints. Instead it seems quite common that villagers are allowed to get medicines for free on condition that they pay later. With a lack of mechanisms to enforce payment, this practice is in reality a kind of exemption mechanism.

This study has neither focused on the delivery of other components of primary health care, although these are without any doubt necessary for overall efficient functioning of the VRDFs (Bigdeli *et al.* 2004). However, one main problem related to developing specific solutions to health demands in remote areas is that the location itself is a problem. The remote villages are often too small to build a comprehensive PHC system, and therefore other less efficient solutions need to be considered. What our findings contribute is that even if this is the case, more can be done to improve the situation regarding drug availability in specific remote villages in addition to general system reforms.

VRDF management

The main problem seems to be the poor management system within the VRDFs. This includes the management of the VRDF committee, the lack of tools and guidelines for VHVs, the delay in drug procurement, low knowledge and experience of VHVs, inadequate monitoring, auditing and supervision of VRDFs from the DHO, a lack of regular reporting and feedback mechanisms, and an inappropriate incentive system at VRDFs. The recurrent budget and drugs in many VRDFs decreased compared with the initial amount, hence it was not possible for them to purchase as many drugs as before. The DHO staff should have monitored, audited and supervised the VRDFs regularly so that they could have assisted the VHVs in time when something went wrong. The limitation of the allocated government budget appeared to be contributing to the inadequate performance of the DHO. In general, the VHVs did not get paid any salary by the Government, they just received some small income from the drug sale benefits.

The delay in drug procurement seemed to contribute much to the low availability of ED at VRDFs. In the Philippines, collaboration with a local NGO facilitated implementation and management of the program and a contact with a commercial wholesaler secured the stable and prompt procurement of drugs to the VRDFs (Tanaka *et al.* 1997), while in Laos such a collaboration and contact did not exist. Thus, only the DHO was responsible for the drug procurement to the VRDFs. It seemed that neither the VHVs nor the DHO staff were aware about the absence of EDs at VRDFs. The VHVs waited until all ED were finished before they requested a new replenishment of drugs and the DHO staff would not supply any drugs to VHVs without receiving the whole report on drug consumption at VRDFs and the new request. A new, suitable and quick system of drug procurement from DHO to VRDF should be put in place.

Limited knowledge and experience of the VHVs was mentioned as another reason for poor management at VRDFs. The majority of them had only had primary school education and had been trained on VRDF twice, on average. The experience from other countries shows that although the knowledge of community health workers had improved after training, it was still not at a sufficient level (Tanaka *et al.* 1997). The basic knowledge on medicine and health among VHVs needs to be upgraded, as well as the public awareness of how to use medicines in a rational way (Keohavong *et al.* 2006).

Methodological considerations

The checklist used to assess the performance of VRDFs was developed for the purpose of the study based on the contents of the RDF guideline at the village level and the real situation and organisation in the village. Although most of the information from the checklist was not available, this negative result calls for a more careful planning and management to improve the VRDFs. As the main aim of our study did not include an assessment of the drug utilisation, we could not use the WHO indicators (WHO 1993; Hogerzeil *et al.* 1993). However, studies on drug utilisation should also be performed since it is an important aspect of the availability and accessibility of ED for the people in remote areas.

The use of different methods - triangulation - for data collection, i.e., interviews with household heads and VHVs, a checklist and group discussions with VRDF committee members and villagers, can be seen as a way of ensuring full comprehension with respect to the availability of drugs, and the performance and sustainability of the VRDFs (Mays and Pope 2000), from all kinds of angles and perspectives.

The selection of ten EDs from the total of 28 was made in order to focus on the most important drugs. However, one of the selected drugs, Potassium Iodide, was not found at any VRDF, although this medicine is very important for the treatment of goitre. This could be due to lacking provision (of this type of drug) to VRDF or because people did not require it.

Conclusions

The availability of EDs at the VRDFs was rather low, showing that the system has failed in achieving its main goal to guarantee availability also in remote areas. In addition, many of the available EDs were expired and had no label. The drug procurement and management system from district to VRDFs did not function well. There were no regular meetings with the VRDF committee and there was no regular monitoring, auditing or supervision of VRDFs. There was also a lack of necessary guidelines for VHVs, and inadequate record keeping. Seeking for health treatment at VRDF by the villagers was low due to many reasons mainly the lack of ED, poor service, limited experience of VHVs and the existence of other health providers, like private pharmacies, private clinics, unlicensed drug sellers and

illegal providers.

Improvement of VRDF performance to ensure sustainability has become a great challenge for the MoH in implementing the government strategy to reduce poverty for people in remote areas. If VRDFs are still to be targeted in the policy, steps to promote sustainability and improvement of the quality of VRDF services at village level should be taken together with more sustainable Government financial support. Those steps should include establishment of a comprehensive management mechanism system for the VRDFs with appropriate supervision from district and provincial levels, improving knowledge and skills of VHVs, developing a system for drug procurement, educational activities for the public and a functioning monitoring system in order to ensure availability of good quality drugs accessible for all those living in remote areas. These improvements are necessary regardless of the overall need for safety security mechanisms to protect the poorest from unaffordable costs.

Acknowledgements

Our thanks to all people, institutions and departments from central to provincial and district levels, who have supported the study. In particular, we thank Dr Boungnong Boupoua, President of NIOPH, and Dr Vilayvang Phimmason, Director of FDD, and Drs Toukham Vanmixay and Choum Chomchaleuane, Directors of Champasak and Khammouane Health Departments. Without assistance of the Heads of FDU of Champasak and Khammouane, and the Heads of District Health Offices in Sanasomboun, Pathoumphone, Nongbok and Sebangfai, this study would not have been possible. We also thank all participating village leaders, VRDF committee members and VHVs, as well as all household participants from the 20 villages. The study is part of the National Drug Policy implementation funded by the Swedish development and cooperation agency (Sida).

References

Bigdeli M, Shuey D, Ketsouvannasane B and Douangdeuane B (2004). Operational research on village revolving drug funds in Lao PDR. Vientiane: World Health Organization & Food and Drug Department, Ministry of Health, Lao PDR.

Food and Drug Department (2003). National drug policy programme 1993-2003. Vientiane: Ministry of Health.

Hogerzeil HV, Bimo, Ross-Degnan D, Laing RO, Ofori-Adjei D, Santoso B, Azad Chowdhury AK, Das AM, Kafle KK, Mabadeje AFB and Massele AY (1993). Field test for rational drug use in twelve developing countries, *Lancet*, **342** : 1408-10.

Jönsson K, Tomson G, Jönsson C, Kounnavong S and Wahlström R (2007). Health systems research in Lao PDR: capacity development for getting research into policy and practice, *Health Research Policy and Systems*, **5** : 11.

Keohavong B, Syhakhang L, Sengaloundeth S, Nishimura A and Ito K (2006). Rational use of drugs: prescribing and dispensing practices at public health facilities in Lao PDR, *Pharmacoepid Drug Safety*, **15**, **5** : 344-7.

Mendis S, Fukino K, Cameron A, Laing R, Filipe Jr A, Khatib O, Leowski J and Ewen M (2007). The availability and affordability of selected essential medicines for chronic diseases in six low- and middle-income countries, *Bulletin of the WHO*, **85**, **4** : 279-88.

Ministerial Decree no. 52/PM on medical services and guide of the public health minister no. 2635 on the same (1995). Vientiane: Ministry of Health.

Ministry of Health, LaoPDR (2001). The Vth national drug conference, February 2001, Report of the Food and Drug Department.

Mays N and Pope C (2000). Qualitative research in health care. Assessing quality in qualitative research, *British Medical Journal*, **320** : 50-2.

Murakami H, Phommasack B, Oula R and Sinxomphou S (2001). Revolving drug funds at front line health facilities in Vientiane, Lao PDR, *Health Policy and Planning*, **16**, 1 : 98-106.

Nabarro D and Cassels A (1994). Strengthening health management capacity in developing countries. London: Overseas Development Administration.

National Statistics Centre (2003). Yearbook. Vientiane.

Paphassarang C, Tomson G, Choprapawon C and Weerasurya K (1995). The Lao national drug policy: lesson along the journey, *Lancet*, **345** : 433-5.

Paphassarang C, Philavong K, Boupha B and Blas E (2002). Equity, privatization and cost recovery in urban health care: the case of Lao PDR, *Health Policy and Planning*, **17**, (Suppl 1): 72-84.

Quick JD (2003). Ensuring access to essential medicines in the developing countries: A framework for action, *Clinical Pharmacology and Therapeutics*, **73** : 279-83.

Stenson B, Tomson G and Syhakhang L (1997). Pharmaceutical regulation in context: the case of Lao People's Democratic Republic, *Health Policy and Planning*, **12**, 4 : 329-40.

Stenson B, Syhakhang L, Eriksson B and tomson G (2001a). Real world pharmacy: assessing the quality of private pharmacy practice in the Lao People's Democratic Republic, *Social Science and Medicine*, **52**, 3 : 393-404.

Stenson B, Syhakhang L, Stalsby Lundborg C, Eriksson B and tomson G (2001b). Private pharmacy practice and regulation - A randomised trial in Lao PDR, *International Journal of Technology Assessment in Health Care*, **17**, 4 : 579-589.

Tanaka M, Kobayashi Y, Hanada K, Suganami S and Nakahara T (1997). A drug revolving fund program for rural villages in the Philippines, *Nippon Koshu Eisei Zasshi*, **44**, 9 : 713-23.

Umenai T and Narula IS (1999). Revolving drug funds: a step towards health security, *Bulletin of the WHO*, 77, 2 : 167-71.

Uzochukwu BSC, Onwujekwe OE and Akpala CO (2002). Effect of the Bamako-Initiative drug revolving fund on availability and rational use of essential drugs in primary health care facilities in south-east Nigeria, *Health Policy and Planning*, 17, 4 : 378-83.

WHO (1993). How to investigate drug use in health facilities. Selected drug use indicators. Geneva: World Health Organization, WHO/DAP/93.1.