

Tuberculosis practices among private medical practitioners in Kaski district, Nepal

Nepal AK,^{1*} Shrestha A,² Baral SC,² Bhattarai R,² Aryal Y²

¹Medical Emergency Relief International, Nepal;
²Health Research and Social Development Forum, Nepal

*Correspondence to: Mr. Anant Kumar Nepal, Medical Emergency Relief International, Nepal, Kuponhole-1, Lalitpur, Nepal, email: ananta_nepal@hotmail.com, Tel. No.: (+977)-1-5544450/ -1-5544250

ABSTRACT

INTRODUCTION: Although the evidences suggest that more than one third tuberculosis (TB) cases are being managed in private sector, the quality of care in private sector is major concern. However, the information regarding the private practices were lacking. Therefore the study was conducted to gain insights on current practices of TB management at private sectors.

MATERIALS AND METHODS: A descriptive cross sectional study, applying quantitative method, was conducted at two cities of Kaski among all private practitioners, private pharmacies and private laboratories through self administered questionnaire and structured interview schedule.

RESULTS: Nearly one fourth of the TB suspects in the district were found to have consulted private providers with about 20.0% of the total smear positive cases diagnosed in private laboratories. Beside sputum microscopy, Private Medical Practitioners (PMPs) were also found to prefer other tests like X-ray, culture for TB diagnosis. Similarly, PMPs' varying prescription of anti TB drugs beyond National TB Programme (NTP) recommendation along with their weak recording and case holding were noteworthy, and the cost of TB treatment seemed higher in private sector. Only one third of private institution had their staff trained in TB. Except some informal linkage, no collaboration between public and private sector was noted.

CONCLUSIONS: Private sector was managing many TB cases in the district. However, their practice of TB management was not much satisfactory. Therefore NTP should take effective measures for Public Private Mix and to make them aware of the standards through training and orientation in order to improve the quality of care.

KEY WORDS: Tuberculosis, Private practitioners, Tuberculosis management, DOTS

Article submitted 18 November. Reviewed 18 December. Author correction 31 December. Final version accepted 31 December 2012

INTRODUCTION

Tuberculosis (TB) remains a major public health threat across the globe particularly under developed and developing countries are the worst hit. In spite of the rigorous efforts, TB control has become more complex and challenging along with growing privatisation of the health sector. National Health Account reported that the private sector plays a significant role in Nepal's health care system, with almost two-third (65%) of Nepalese health care directly financed by private. Since the introduction of allopathic health system, professionals are practicing in both public and private sectors. Thus, the national health systems cannot be result-oriented without effective framework for public private mix (PPM). Despite the proven success of Directly Observed Treatment Short-course (DOTS) strategy, its design and implementation still needs to be fully systematised within non-state sector where large TB cases are utilising services.¹ Therefore, engaging all health care providers in TB control has become a primary component of the Stop TB Strategy and the initiatives of such collaboration are being successful to strengthen the National TB Control Programme (NTP).^{2,3}

Anecdotal evidences suggest that the private providers have major role in TB care viz. referral, diagnosis and treatment, particularly in urban areas.¹ A report suggested that 60-70% of all TB patients prefer to use private sector in South East Asia.⁵ Thus, private sectors have a large portion of first contacts, but TB patients are poorly managed by them which might lead to delayed cure, increased numbers of chronic transmitters, drug resistance and increasing incidence of TB.^{6,7} Given the poor regulatory mechanism to monitor the quality of private health sectors in most developing countries including Nepal, private practitioners (PPs) often deviate from the standard TB management practices which could affect the outcome of overall National tuberculosis control efforts.^{8,9}

Realizing that the private sector is already delivering services to TB patients, it has been further recognised that the approach of PPM can ensure better access and quality of TB care to all.¹⁰ However, little is known about the practices and performances of PPs in TB care. This study has therefore focused to understand the current TB management practices of private practitioners, private pharmacies and private laboratories termed here as the private medical practitioners (PMPs).

MATERIALS AND METHODS

A descriptive cross-sectional study was carried out in the cities of Kaski district: Pokhara sub-metropolitan city and Lekhnath municipality among all private qualified doctors with at least Bachelor in Medicine and Bachelor in Surgery (MBBS) or equivalent, private pharmacies and laboratories in the respective area. Practitioners working in public sector and also having private practice in the afternoon/morning were also considered as PMPs. Altogether 142 private pharmacies and 42 private laboratories were enrolled in the study. Semi-structured interview schedule was used for them. Similarly, out of 48 private practitioners, 45 were approached with self-administered questionnaire and among them only 30 had responded that made the basis for analysis.

Data were entered and analysed using the Statistical Package for Social Sciences version 16 (SPSS v.16). Descriptive statistics were used and presented in tabular forms. The analysis of attitudes employed the five-point Likert scale -2 to +2 as follows: strongly agreed, agree to some extent, don't know, disagree to some extent and strongly disagreed. The attitudes were scored and categorised into three levels: negative, moderate and positive.

The study included mostly registered private health care providers though there might be many unregistered and excluded non allopathic health care providers.

Ethical approval for the study was obtained from Nepal Health Research Council (NHRC). Informed consent was taken from all the respondents and confidentiality was strictly maintained.

RESULTS

General characteristics of PMPs and TB case load in private sector

Out of 30 private practitioners, 16 were specialised doctors while the rest 14 were general medical practitioners with MBBS degree. It was found that majority of them (80%) were government employees and in an average one practitioner sees 4 patients in an hour in his/her private clinic. Out of 42 private laboratories, 35 of them (83.3%) were providing Acid Fast Bacilli (AFB) testing services. Among those with AFB services, 60% was using binocular microscope while more than one third of them (35%) were using monocular microscope and 5% of them were using both types.

Table 1. Tuberculosis Suspects in Private Medical Practitioners

No. of TB Suspects	Pharmacy n=142 (%)	Private Practitioners n=30 (%)
0	11 (7.7%)	12 (40%)
1 to 5	113 (79.6%)	10 (33.3%)
6 to 10	13 (9.2)	4 (13.3%)
>10	5 (3.5)	4 (13.3%)
Total TB suspects in PMPs	189 (PTB: 141 and EP: 48)	
Total TB diagnosed	39 (PTB: 30 and EP: 9)	

Table 2. Tuberculosis Cases in Private Medical Practitioners with Compared to National TB Control Programme

Particulars	Private Lab (average)		NTP (Source: DPHO, Kaski)
	One month	4 months (%)	4 months (%) 1 st quarter, 066/67
TB Suspects	117	468 (24)	1478 (76)
Smear Positive Cases	8	32 (19)	136 (81)
Total AFB Slides Examined	231	924(17.3)	4429 (82.7)

Only 9 out of 30 private practitioners had received training on tuberculosis. Similarly, only in 20.4% of the private pharmacies and 26.2% of the private laboratories, staff had received few training on TB.

The survey found that nearly 4 out of 5 private pharmacies (79.6%) had 1 to 5 pulmonary tuberculosis (PTB) suspects seeking care from them in a month prior to this study and 9.2% of them had 6 to 10 PTB suspects in their pharmacies. Similarly one third (33.3%) of the private practitioners had 1 to 5 and 13.3% of them had seen more than 10 PTB suspects in their private practice. A total of 189 TB suspects had undergone diagnosis in private practitioners of which 30 were diagnosed with pulmonary TB and 9 were Extra-pulmonary tuberculosis.

A total of 117 TB suspects had undergone AFB test in private laboratories, out of which 8 were diagnosed as sputum positive. Based on one month data, average of 32 smear positive cases would have been diagnosed in private sectors. Considering the district total, one fourth of the TB suspects had reached to the private laboratories for examination. Similarly, 19% of total diagnosed cases were from private sector. Moreover out of total AFB slides examined in the district during the period, 17.3% of them were examined in the private sectors.

A total of 117 TB suspects had undergone AFB test in private laboratories, out of which 8 were diagnosed as sputum positive. Based on one month data, average of 32 smear positive cases would have

been diagnosed in private sectors. Considering the district total, one fourth of the TB suspects had reached to the private laboratories for examination. Similarly, 19% of total diagnosed cases were from private sector. Moreover out of total AFB slides examined in the district during the period, 17.3% of them were examined in the private sectors.

Knowledge and practice of PMPs on TB

Almost all of PMPs were aware of the presenting symptoms of TB. However only 59.9% of the pharmacists knew that PTB should be suspected if cough persists more than 2 weeks while more than one fourth (28%) of them reported PTB is suspected if blood is seen in sputum.

Table 3 showed that half of the PPs knew the case definition of smear positive TB as defined by the NTP and sputum microscopy was mostly preferred by them (96.7%) for its diagnosis. However, other tests were also equally preferred: chest X-ray, Montoux test, clinical examination and sputum culture.

Similarly, 80% of PPs reported that they always advise sputum microscopy for TB cases. 90% of them mentioned that they request three sputum smears with at least one morning sample while 10% of them replied that they request only 2 smears - one on the spot and another of the morning next day.

Among the PPs who had TB suspects/patients in

Tuberculosis practices among private practitioner

Table 3. Knowledge and Practices of Private Practitioners on TB Management

Knowledge and Practice	n(%)
Case Definition of Smear Positive TB (n=30)	
At least two sputum smear positive	6 (20)
One sputum positive and chest X-ray consistent	5 (16.7)
At least one sputum positive and culture positive	4 (13.3)
All of the above	15 (50)
Tests Preferred for Pulmonary TB (n=30)*	
Sputum microscopy	29 (96.7)
X-ray	27 (90)
Sputum culture	4 (13.3)
Biopsy	1 (3.3)
FNAC	1 (3.3)
Monteux test	14 (46.7)
Clinical examination	11 (36.7)
Practice of Sputum Smear for PTB (n=30)	
Always	24 (80)
Sometimes	6 (20)
No. of Sputum Smear (n=30)	
Two smears- one on the spot and of the morning next day	3 (10)
Three smears with at least one in the morning	27 (90)
Investigation Tests advised for the patients (n=22)*	
Sputum microscopy	15 (68.2)
X-ray	18 (81.8)
Sputum culture	6 (27.3)
Biopsy	3 (13.6)
FNAC	10 (45.5)
Monteux test	14 (63.6)
Clinical examination	3 (13.6)

their private clinic (during a month prior to the study), 4 out of 5 private practitioners had advised X-ray for investigation followed by Sputum Microscopy, Montoux test, FNAC, sputum culture and biopsy.

Anti TB drugs prescribed by PMPs

The study revealed that different treatment regimens were prescribed by the PPs for different categories of tuberculosis as shown in table 4. 27 out of 30 PPs had filled the prescription for the cases mentioned in the questionnaire while 3 of them hadn't responded to it.

The majority of PPs (86.7%) had prescribed HRZE for new smear positive TB for initial phase of treatment while rests had prescribed 2HRZE or 2SHRZ. For same case, more than half (56.7%) of them had prescribed 4HR followed by 6HE and 6HR for continuous phase.

Three different regimens were prescribed for extra pulmonary tuberculosis in initial phase: 2HRZE (63.3%) followed by 2HRZ and 2HRE while for continuous phase, there were 4 different regimens: 4HR (53.3%) followed by 6HE, 6HR and 6HE or

4HR. Likewise for relapse case, 5 different treatment regimens were prescribed by the practitioners for initial phase out of which only 40.0% were correct (2SHRZE + 1HRZE) followed by 2HRZE, 2SHRZE, 3SHRZE and 3HRZE while for continuous phase, only 36.7% mentioned correctly (5HRE) and the rest prescribed 6HRE, 5HR and 6HR. More importantly streptomycin prescription was noted for a newly diagnosed case and 1 out of 4 PMPs prescribe streptomycin for the relapse case.

Follow up and monitoring of TB patients

Table 5 below showed that the follow up and monitoring of TB patients by PMPs. Usually the PMPs arranged follow up visit of their patients in one month (40%) followed by 2 weeks, one week and more than a month (table 5). The majority (80%) of the practitioners mentioned that the sputum microscopy is the most useful test used in the follow up of the pulmonary TB cases. However, the rests mentioned chest X-ray, clinical examination and others like ECR. Out of those who mentioned sputum microscopy as a follow up tests, only one third of them reported sputum microscopy being done after 2 months or at the end of intensive phase, 5 months and at the end of treatment while

Table 1: Anti TB Drugs Combination Prescribed by Private Medical Practitioners (n = 30)

Cases	Initial Phase	Continuous Phase
New Smear Positive	2HRZE (86.7%) ^a	4HR (56.7%) ^a
	2SHRZ or 2HRZE (3.3%)	6HE (23.3%)
		6HR (10%)
Extra pulmonary	2HRZE (63.3%) ^a	4HR (53.3%) ^a
	2HRZ (16.7%)	6HE (16.7%)
	2HRE (10%)	6HR (16.7%)
		6HE or 4HR (3.3%)
Relapse	2SHRZE + 1HRZE (40%) ^a	5HRE (36.7%) ^a
	2HRZE (20%)	6HRE (30%)
	2SHRZE (16.7%)	5HR (13.3%)
	3SHRZE (6.7%)	6HR (10%)
	3HRZE (6.7%)	
No response	3 (10%)	

^aNTP recommended Regimen,[H -Isoniazid, R - Rifampicin, Z - Pyrazinamide, E - Ethambutol, S - Streptomycin]

Table 5. Follow up and Monitoring of TB Patient by Private Medical Practitioners

Follow up	Frequency n= 30 (%)
Follow up Arrangement	
One week	6 (20)
Two weeks	10 (33.3)
One month	12 (40)
More than a month	2 (6.7)
Investigation for Monitoring PTB Cases	
Sputum microscopy	24 (80)
Chest X-ray	4 (13.3)
Clinical examination	1 (3.3)
Other	1 (3.3)
Sputum Microscopy for Follow up (n= 24)	
2 months or at the end of intensive phase	11 (45.8)
5 months	1 (4.17)
At the end of treatment	4 (16.7)
All of above	8 (33.3)

while 45.8% of them were found to report follow up test only at 2 month or at the end of intensive phase and 16.7% at the end of treatment only.

Patient record and Case holding

Only one fourth (26.7%) of the PMPs mentioned that they had properly maintained the record of patients in their private practice. Practitioners reported that they counsel the TB patients and their family

members and arrange regular follow up visits to ensure treatment adherence. Very nominal stated that they have defaulter tracing mechanism. But it is not clear whether or not the patients missed in the follow up dates are called or tried to call. Only one fifth of the practitioners mentioned that TB patients in their clinic completed the full course of treatment. More than half of the PMPs didn't respond to it which reveals that either they do not have proper record or the patients have defaulted. The lengthy treatment,

multi drugs with many side effects, poor socioeconomic condition of the patients and poor counselling were the major reasons reported by the practitioners for poor adherence of TB patients to the treatment.

Costs of TB treatment in private sectors

The average cost in private sectors seemed to vary with varied range of charges for various services and is shown on table 6.

The average consultation cost of a PP was NRs. 254 (range 100-300). Similarly the costs for laboratory services also seemed to vary from one another. The study explored that anti-TB drugs with different doses and different trade names were available on the market. Also the composition differed from one another as well as from the NTP regimen.

On average the total cost of medicine for six months would be around NRs. 2880 in private while it is free of cost in public health facilities. Also it is noticed that in private sectors, doctors are prescribing medicines for longer than six months. For follow up visits, up to certain period of time, consultation cost was found to be free; most of the time, the patient didn't have to pay for up to 2 weeks. Thus, considering all these expenses including laboratory services, consultation charge, transportation, etc, TB treatment across the private sector is higher.

Attitude towards National Tuberculosis Control Programme

The majority (66.7% and 63.3%) of the practitioners strongly agreed that NTP is one of the most effective programmes of Nepal and it's treatment regimen is in line with World Health Organisation (WHO) recommendation respectively (Table 7).

More than half (53.3%) of PPs strongly agreed that NTP is decentralised up to the grassroots level. However, nearly one third (30.0%) of them strongly disagreed that NTP provides regular training and orientation to all private health care providers. 70.0% of PPs strongly agreed that private sectors' involvement in NTP is necessary. Similarly more than half of the practitioners strongly agreed that private sectors bear more than half of the TB burden in Nepal.

Considering all these, most of the private

Figure 6. Total Cost of TB Treatment in private

Services	Average cost(NRs)	Range
Consultation	254	100-300
Sputum microscopy	110	50-200
X ray	181	115-200
Sputum culture	258	200-500
Biopsy	412	400-450
FNAC	535	300-1500
Montoux test	145	50-200
Follow up each Visit	254	100-300
Medicine Cost (For 6 months treatment)	2800	

practitioners were found to have positive attitudes towards the NTP. The study didn't notice any formal linkages between NTP and PMPs. However, majority of PMPs stated that they are willing to be linked with NTP and provide services accordingly and for this, many of them wished to have some sorts of incentives.

DISCUSSION

The private sector is found to hold a considerably higher number of tuberculosis cases especially in urban areas where a wider range of PPs is providing TB treatment. About half of the TB cases are estimated to be in private sectors which are not reported to the NTP.^{1,2} Considering this, WHO has endorsed International Standards of Tuberculosis Care¹ so as to ensure effective and high quality of care for all TB patients regardless whether they receive care from the public or private sector. However PPs are often found to lack knowledge on these standards and national protocol of TB treatment, and often deviate from NTP and even from the standards.^{5,8}

In consistence with these, the study also found a considerable percentage of TB cases being dealt with in PMPs and it cannot be underestimated that the people seeking help will receive the services whatever these providers offer to them.⁶ This study showed that only 20.0% of the pharmacies and 26.0% of the laboratories had their staff trained on TB. Importantly, majority of the PPs (80.0%) were employed in government service but only 9 out of 30 practitioners had received training on TB. This suggests that adequate trainings need to be provided to PMPs in order to deliver the services.

In the study, most of PMPs were aware of national standard of TB diagnosis. However, it is worth noting that 1 out of 5 PMPs didn't always advise

Table 7. Attitude of Private Medical Practitioners towards National TB Control Programme

Statements	Strongly agree (%)	Agree some extent (%)	Disagree some extent (%)	Strongly disagree (%)	Don't know (%)
NTP is one of the effective disease control programmes of Ministry of Health	20 (66.7)	9 (30)	1 (3.3)	0 (0)	0 (0)
NTP's TB treatment regimen is in line with WHO recommendation	19 (63.3)	11 (36.7)	0 (0)	0 (0)	0 (0)
NTP is decentralised up to the grass root level	16 (53.3)	8 (26.7)	1 (3.3)	2 (3.3)	4 (13.3)
NTP's regular training and orientation to all private health care providers	7 (23.3)	5 (16.7)	3 (10)	9 (30)	6 (20)
Involvement of private health care sector in NTP is necessary	21 (70)	7 (23.3)	1 (3.3)	1 (3.3)	0 (0)
Private sectors bear more than half of the TB burden in Nepal	17 (56.7)	8 (26.7)	3 (10)	1 (3.3)	1 (3.3)
To make available accessible/ affordable services to all TB patients is the sole responsibility of NTP	13 (43.3)	4 (13.3)	6 (20)	7 (23.3)	0 (0)
Anti TB drugs provided by NTP are of poor quality	13 (43.3)	0 (0)	0 (0)	7 (23.3)	10 (33.3)

sputum microscopy for diagnosis of PTB. This shows that PPs often don't practice what they know is medically true.⁸ Also the study found that majority of the private laboratories had AFB services but only 60.0% of them were using binocular microscope. For the rest of the laboratories, AFB tests were not reliable enough. This improper diagnostic practice might expose the patient to the risks of unnecessary/wrong treatment and may delay proper diagnosis and treatment, thus imposing high risk of disease communicability.¹ More importantly PMPs were equally found to advise other clinical tests like X-ray, sputum culture, Montoux test and so on which add financial burden to the patients.

This study further revealed that different anti-TB drug combinations and regimens were prescribed by the PPs for TB treatment. Also eight months regimen was in practice though NTP Nepal has already adopted six month regimen in TB treatment. Though majority of the prescribed anti-TB drug combination was in line with the NTP, a considerable percentage were found to deviate from the standard and exceeded the recommended duration for all of the given cases. This over duration and improper treatment practice could lead to drug resistance, and also result in poor adherence and high treatment cost.⁸ The study also explored that different forms of anti-TB drugs with different combination and composition were available on the market to which people have easy

access to. On average it would cost NRs. 2800 to purchase anti-TB drugs for only six months of TB treatment in the private sector. The cost usually exceeds this amount since it was found that PMPs often gave prescriptions for a longer duration. Similarly, when other costs such as consultation fee of PMPs, follow up charge, costs for diagnostics tests and laboratory services are considered, the cost in private sector appears to be higher and could not be affordable to all TB patients.

Further, overall TB case management include patient adherence to treatment, regular monitoring, management of side effects and complications, health education, and proper recording and reporting to the concerned. Under NTP, DOTS is available where patients daily take medicine in direct observation of treatment supervisor; however there is no such practice in the private sector. In the study, majority of practitioners were found to arrange follow up within one month but it is inadequate. It is worth noting to see that only one out of five PMPs could mention that their patients completed the treatment in their clinic. Majority of them reported that neither they do have proper recording of the patients nor do have any mechanism to trace the defaulters while proper recording and defaulter treatment are of utmost importance in TB control and it is the responsibility of the practitioners to ensure the adherence to the treatment and address the poor adherence if it occurs.^{1,13} Major reasons behind the poor adherence

to the treatment were noted as lack of knowledge, poor counselling, lengthy treatment, multi drugs and side effects, and poor socio economic condition. Very few of them reported that they properly counselled the patients and their family members. However, it cannot be said whether or not the practitioners had properly ensured patients adherence and that all patients completed a full course of treatment. This reflects weak case holding of TB patients in the private sector. Also they are not reporting to the national programme. However, it was found most of the PMPs had positive attitude towards the NTP and expressed their willingness to have a link with national programme. This eagerness along with their positive attitude reveals the feasibility of the effective implementation of PPM in the area.

CONCLUSION

Though, numbers of TB cases were seeking care from private sector, PMPs were not properly trained in delivering TB services. The overall TB case management including monitoring, record keeping and case holdings at private was not much satisfactory and needs improvement. Diagnostic and treatment practices were not proper enough to maintain the quality as recommended. Easy availability of anti-TB drugs in the market was noted as well as prescriptions for TB treatment were varied. Most of the practitioners was positive towards the NTP and showed their eagerness to be linked with it.

ACKNOWLEDGEMENT

The authors would like to thank all the respondents and research team. This study was conducted by Health Research and Social Development Forum (HERD), for National TB Control Programme, Nepal under Global Fund support and is gratefully acknowledged.

CONFLICT OF INTEREST: None to declare.

FINANCIAL INTEREST: None to declare.

REFERENCES

1. World Health Organization. Involving Private Practitioners in TB Control: Issues Intervention and Emerging Policy Framework. WHO/CDS/TB/2001.
2. World Health Organization. Engaging All Health Care Providers in TB Control: Guidance on

Public-Private Mix Approaches. Geneva: Switzerland; World Health Organization; 2006.

3. World Health Organization. Regional Strategic Plan for TB Control 2006-2015. New Delhi: WHO Regional Office For South East Asia; 2006
4. World Health Organization. The World health report 2008: Global tuberculosis control: surveillance, planning, financing. World Health Organization; 2008.
5. World Health Organization. Involving Private Medical Practitioners in TB and STI Control, Report of an informal consultation Bangkok, 20-22 Feb. 2001. New Delhi: WHO Regional Office for South East Asia; 2001
6. Quality Assurance Project (QAP). 2004. Treating Tuberculosis in the Private Sector: Cambodia. Operations Research Results. United State Agency for International Development (USAID), 2004.
7. Newell JN. The implication for TB control of the growth in numbers of private practitioners in developing countries. *Bull World Health Organ* 2002;80:836-837
8. Khan J, Malik A, Hussain H, et al. Tuberculosis diagnosis and treatment practices of private physicians in Karachi, Pakistan. *East Mediterr Health J* 2003;9:769-775.
9. Hurtig AK, Pande SB, Porter JD, Bam DS. Tuberculosis treatment and private practitioners, Kathmandu Valley. *J Nepal Med Assoc* 2000;39:163-168.
10. Newell JN, Pande SB, Baral SC, Bam DS, Malla P. Control of tuberculosis in an urban setting in Nepal: public private partnership. *Bull World Health Organ* 2004;82:92-99
11. Tuberculosis Coalition for Technical Assistance. International Standards for Tuberculosis Care (ISTC). The Hague, Tuberculosis Coalition for Technical Assistance, 2006
12. Maamari F. Case-finding tuberculosis patients: diagnostic and treatment delays and their determinants. *East Mediterr Health J* 2008;3:531-545
13. Uplekar MW, Juvekar SK, Parande SD, et al. Tuberculosis management in private practice and its implications. *Indian J Tuberc* 1996;43:19-22.

Citing this article

Nepal AK, Shrestha A, Baral SC, Bhattarai R, Aryal Y. Tuberculosis practices among private medical practitioners in Kaski district, Nepal. *Int J Infect Microbiol* 2012;1(2):68-75.
