Resistance and renewal: health sector reform and Cambodia's national tuberculosis programme

Peter S Hill[a] & Mao Tan Eang[b]

Abstract Following the destruction of Cambodia's health infrastructure during the Khmer Rouge period (1975–1979) and the subsequent decade of United Nations sanctions, international development assistance has focused on reconstructing the country's health system. The recognition of Cambodia's heavy burden of tuberculosis (TB) and the lapse of TB control strategies during the transition to democracy prompted the national tuberculosis programme's relaunch in the mid-1990s as WHO-backed health sector reforms were introduced. This paper examines the conflicts that arose between health reforms and TB control programmes due to their different operating paradigms. It also discusses how these tensions were resolved during introduction of the DOTS strategy for TB treatment.

Bulletin of the World Health Organization 2007;85:631–636.

Une traduction en français de ce résumé figure à la fin de l'article. Al final del artículo se facilita una traducción al español. الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

Introduction

In 1993, the Cambodian Ministry of Health and the recently re-established WHO country office relaunched the national tuberculosis (TB) programme, translating into action what had been a rhetorical priority for more than a decade. Despite a decade of United Nations sanctions implemented immediately following the disastrous Khmer Rouge period (1975–1979), the original national TB programme had struggled to establish itself with support from the French Red Cross. TB control lapsed again during the period of the United Nations Transitional Authority in Cambodia (UNTAC) (1991–1993) with failures in technical support, drug supplies, training, case-detection and treatment activities (A Zwi et al., unpublished data, 2003). Despite substantial challenges, by the end of 1994 the national TB programme was active in 10 of Cambodia's 24 provinces. It had a patchwork of 14 international donors guaranteeing continuing drug supplies, it had renewed staff training and supervision, and it introduced the DOTS strategy. It also had commitments to expand TB services to every administrative district.[1]

The national programme's relaunch coincided with comprehensive health-sector reforms initiated by the health ministry with the support of WHO, key bilateral donors and NGOs.[2] These reforms included an ambitious "health coverage plan" intended to rationalize and extend health services across the country. This plan was based on a re-conceptualization of districts for health service delivery and a redefinition of the roles of health facilities within those districts.[3] The implementation of the health coverage plan created significant tensions for the expanding TB services; these have only recently been resolved through the provision of resources to scale up DOTS in a format more readily reconciled with the health coverage plan.[4]

This paper examines the interaction between health sector reforms in Cambodia and the national TB programme's expanded activities. It also looks at the impact of recent trends in international health policy and development assistance on the Cambodian health system and on TB control.

Post-conflict Cambodia

By the time the Khmer Rouge were defeated in 1979, little of Cambodia's health system remained intact. Much of the infrastructure had been destroyed, and fewer than 50 doctors of the 600 practicing before 1975 remained.[5] The health system's rebuilding began immediately as the few remaining doctors assumed responsibilities as teachers, clinicians and administrators. United Nations support – with the exception of UNICEF – was limited. Direct bilateral assistance from developed countries was nonexistent and the community of non-governmental organizations (NGOs) was largely absent, particularly those organizations that depended on the United States Agency for International Development for support.[6,7]

Despite the peace accords signed in Paris in 1991, Khmer Rouge activity persisted until 1997, and unmapped land mines and poor infrastructure initially limited the districts that could be assisted.[8] Prior to 1995, development assistance focused on the rehabilitation of provincial hospitals and programmes providing maternal and child health care;

[a] International Health, School of Population Health, University of Queensland, Herston Road, Herston 4029, Australia. Correspondence to Peter S Hill (e-mail: peter.hill@sph.uq.edu.au).

[b] CENAT (National Centre for Tuberculosis and Leprosy Control), Phnom Penh, Cambodia.

doi: 10.2471/BLT.**06.036822**

(*Submitted: 22 September 2006 – Final revised version received: 4 February 2007 – Accepted: 22 February 2007*)

TB and leprosy control were confined to provinces where government troops could provide security.[9] The challenge facing the under-resourced health ministry was to ensure a more equitable distribution of resources from the capital and its surrounding provinces to the nation, and to rectify the poor distribution of health personnel and facilities. This agenda was addressed through the health coverage plan.

The health coverage plan

With the election of a coalition government in 1993, WHO implemented the first phase of its project to strengthen the health system, building capacity within the health ministry and developing plans to rehabilitate the health sector. The health coverage plan was introduced in 1996. It uses a two-tier model to provide cost-effective but comprehensive services with no functional gaps. Each level performs specific functions. Health centres offer a minimum package of activities and provide basic curative and preventive care. The operational district referral hospital level expands on the offerings of health centres, by including a complementary package of activities addressing more complex issues and providing pathology services (including TB microscopy), a blood bank, radiological services and surgical facilities.[10]

The health coverage plan differed significantly from how health services had been provided previously: rather than adapting existing health infrastructure to accommodate the disparate demographics of districts reflected within existing administrative boundaries, the model used epidemiological estimates to standardize operational districts and replicate them across the nation. Operational districts no longer merely coincided with administrative district boundaries, but were based on the functional capacities of the operational district referral hospital and its network of health centres. The optimal size of each district was determined by the referral hospital's technical capacity and the workload generated by a population base of at least 100 000. The estimates were based on the demand for acute surgery, including emergency obstetric interventions, together with inpatient medical care, radiology and pathology services.[11,12] Catchment areas for health centres were set with a ceiling of 10 000. Above that level, the workload was deemed likely to be too great, thus diminishing the quality of care; below that level, the workload was deemed too light to justify the concentration of resources. Although the activities of maternal and child health programmes dominated the calculations, projected numbers of new TB cases formed part of the estimates, and management of uncomplicated TB was included in the initial minimum package of activities designed to be delivered at the health centre level. However, the national TB programme was not engaged in developing the foundation health centre training manual, and extending training in TB case identification and management to health centre staff was not negotiated at that stage. At this point in the reforms, TB management – including DOTS – remained a hospital-based activity.

The health coverage plan explicitly reconfigured political and administrative boundaries. Similar to reforms in other developing countries,[13] the health ministry used its key role in planning to recentralize control, removing it from the provincial health authorities who had been the primary recipients of development assistance during the immediate post-conflict period. The plan was to integrate national programmes – malaria, TB, maternal and child health – into operational district structures later. The health coverage plan was designed so that 185 former provincial and district hospitals would be collapsed into 69 operational district referral hospitals. Altogether, 121 former district hospitals were to be downgraded to health centres, and 792 commune clinics were upgraded to the same status. A total of 475 commune clinics were to be phased out.[3] In this radically reconfigured health landscape, the national TB programme attempted to provide national coverage of TB services.

The national tuberculosis programme

The relaunch of the national TB programme in 1994 followed a decade of constrained activity during which continuing security problems limited service provision to only 85 hospitals in 10 provinces. The French Red Cross was largely responsible for the programme's financial and technical support. During the 1970s there had been no TB control activities as the nation lurched from civil war into the Khmer Rouge genocide. The French Red Cross withdrew from Cambodia during the transition under UNTAC, and funding, staffing levels and case-management activities fell. Reviews by the International Committee of the Red Cross, WHO and Médecins sans Frontières identified problems with drug procurement, distribution and control; poor staff performance; and inadequate case-finding and follow-up (A Zwi et al., unpublished data, 2003).

In 1993, WHO and the Ministry of Health, recognizing the situation's severity, launched a campaign to re-establish TB as a priority for the ministry and foreign donors.[1] The appeal secured ongoing financial support for TB drugs, with half available from existing central medical store stocks and the remainder from a consortium of 14 international donors. The failure of a single donor to assume responsibility for the programme had mixed implications for its governance: while the programme lacked the security often provided by a principal donor, accountability to a matrix of donors provided greater autonomy for local leadership.

Planning for 1994–1997 was ambitious, based on conservative models of TB control and the idea of extending TB units (laboratories, specialist technical expertise, statistics and inpatient facilities) to all district hospitals, "but the health sector reforms intervened, collapsing half of the district hospitals into operational districts" (I Onazaki, personal communication, 2003). Of the projected 145 TB units, about 75 were to be located in former district hospitals now designated as health centres. Under the reforms these were to provide minimal services, which precluded inpatient treatment and laboratory facilities and did not initially include TB case management.

The health ministry and health sector reform advisors set clear guidelines for developing operational districts. TB services would be integrated into communicable disease control services at the operational district level, their information systems would be integrated into a national health information system and supervision would be offered through operational district management.[3] Strict conditions were provided for the exceptional circumstances under which TB inpatient beds could be retained in former district hospitals (at this stage termed "health centres with beds"). The

conditions stated that TB beds could be retained in former district hospitals only if the designated operational district referral hospital did not have the capacity to care for TB patients; if the former district hospital had more than 40 new TB inpatients a month; and if the former district hospital was more than 40 km or 2 hours' travel time from the operational district referral hospital. Few former district hospitals met these criteria.

The national TB programme resisted these proposed changes. Historically patients had been admitted during the intensive initial treatment phase; this was justified by the usual late presentation of cases, the persisting context of insecurity and the prohibitive costs of transport.[14] A constrained introduction of the DOTS strategy occurred during the same period; it was administered through hospital-based TB units and admission facilitated direct observation. The provision of free food to TB inpatients through the World Food Programme had been shown to enhance case-detection; the continuing political insecurity and costs associated with travel justified maintaining the mandatory admission policy as well as preserving laboratory facilities.[15] As late as the 2002 review of the health coverage plan, TB management was identified as a continuing impediment to the conversion of remaining former district hospitals to health centres, although the reformers were by this time conceding that the transition might take longer than originally anticipated. The high incidence of TB, the threat of HIV compounding the danger from TB, limitations in the referral system and "sensitivities about closing former district hospitals" were cited as mitigating factors by the health ministry review team.[16]

For former district hospitals, retaining the capacity to provide TB inpatient care provided other marginal benefits that gave them an advantage over health centres. Although health centres were already showing higher incomes than former district hospitals from user fees (as a result of better compliance with standards set out in the minimum package of activities), former district hospitals received higher total income due to the maintenance of their historical funding as hospitals.[17] Given the vulnerable economic situation of staff at district level – despite the early promise of improved conditions as a result of reforms – their reluctance to surrender the advantages associated with maintaining hospital status is understandable.[14]

DOTS: reconciling TB control and reforms

In August 1999, the Japan International Cooperation Agency (JICA) began a 5-year technical cooperation project with the national TB programme. Although technical support from WHO continued, and funding from multiple donors remained essential, the stability offered by JICA during its commitment enabled the national TB programme to decentralize further its control strategies and to extend DOTS from hospital-based delivery to health centre delivery.

In 2000, the DOTS programme included 60 health centres. The early transition to health centre delivery was criticized for slow implementation and for including inadequate health education initiatives.[18] However, by February 2003, DOTS was available in 492 health centres;[19] by the end of 2005, it was available in 853 health centres and 40 health posts.[20] WHO's 2003 country profile of Cambodia linked this expansion to the "positive impact of the health sector reforms … demonstrated by the fact that, by 2002, core primary health care services were available in … approximately 650 health centres."[21]

In 2002, with JICA's assistance, an ambitious national TB prevalence survey with a sample size of more than 30 000 people was undertaken. A smear-positive TB prevalence rate of 362 cases/100 000 population was found among those aged > 10 years with an overall rate of 269/100 000 population.[22] Although this overall rate compared favourably with WHO's estimates from the late 1980s of 455/100 000, it confirmed Cambodia's position on the list of 22 countries with a high burden of TB and provided a further catalyst for accelerating expansion of DOTS at the health centre level.

The presentation of the preliminary prevalence data located these results in the context of the developing DOTS strategy and highlighted the potential threat of the HIV epidemic: 13% of smear-positive cases were also HIV-positive.[22] The national TB programme built on its strategic plan for tuberculosis control[19] by reorienting its strategies. By extending DOTS training to general health staff at the referral hospital level and within former district hospitals, it became possible to integrate TB inpatient and outpatient care. TB units then focused on providing supervision and support for staff at health centres; this was done under a compromise with health sector reformers that allowed for increases in diagnostic facilities (178 TB units in 2007) along with progressive reductions in the dependence on early admission for treatment. Funding from JICA, the Canadian International Development Agency and WHO guaranteed funds for transportation, diagnostic smears and X-rays, shifting the incentives for case management from the district level to health centres. Funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria in Round 2 in 2004, and subsequently in Round 5, has sustained these activities and facilitated a social mobilization initiative. This includes extensive education campaigns, collaborations with NGOs to train people in villages to observe TB treatment under the DOTS strategy, and a tentative exploration of extending support for DOTS through the urban private sector. The strategies have been broadly successful (Table 1), and Cambodia is well placed to meet its Millennium Development Goals for tuberculosis.

Discussion

The evolution of the national TB programme in Cambodia in the context of health sector reforms provides a valuable case study for TB control in countries that are among the world's least-developed. Three issues have been critical to establishing the programme: securing a stable and predictable funding base, adopting the DOTS treatment paradigm and integrating TB control into the heath coverage plan, which resulted largely from the adoption of DOTS.

While the civil war affected the whole health system, TB control was particularly disadvantaged. Apart from the irregular provision of salaries, the health ministry had minimal budgetary allocations for services; supervision, drug supply and logistics for disease-control programmes were largely dependent on external donors. The global resurgence of interest in TB provided the necessary stimulus to re-establish the national TB programme in 1994, but although

Table 1. **Progress towards key indicators since introduction of DOTS strategy for tuberculosis, Cambodia, 1999–2005**

Indicator	Year						
	1999	2000	2001	2002	2003	2004	2005
Population (millions)	11.7	12.0	12.3	12.6	12.9	13.0	13.3
Cumulative number of health centres offering DOTS[a]	9 (0.9)	59 (6)	264 (29)	387 (41)	706 (75)	840 (98)	853 (100)
Number of new smear-positive cases	15 774	14 822	14 361	17 258	18 923	18 978	21 001
Number of new smear-positive cases/100 000 population	135	123	117	137	147	145	158
Case-detection rate[b] (% of total new cases that are smear-positive)	59	54	51	61	65	64	70
Treatment success rate[b]	92	91	88	89	93	91	90

Source: National Centre for Tuberculosis and Leprosy Control, Cambodia
[a] Values are number (%).
[b] Values are percentages.

WHO provided technical assistance, donor support was fragmented until the JICA cooperation project began in 1999.

In part, the early failure to secure a donor partner reflected the emergence of the sectorwide approach in development assistance in Cambodia; this focused on providing comprehensive sectoral, rather than project-based, support. The country's health sector reforms restructured the delivery of district health services, but their limited engagement with national programmes – including TB control – perpetuated conservative models of disease control.

With the TB control programme still locked into a paradigm that depended on hospitalization, there was no easy way to incorporate TB control into the minimum package of activities expected of health centres. Yet health centres are actually the most appropriate locus for community-based control strategies. The national TB programme's imperative to widen coverage, based on the expanded availability of TB pathology services and inpatient wards, placed it in direct conflict with broader health sector reforms. Without a champion for TB's specific programme needs, TB control was marginalized in the emerging health structures. Cambodia was not alone in confronting this tension: issues around the risks implicit in the integration of TB programmes into comprehensive services have been raised in several countries that are reforming their health sectors.[23-26]

The breakthrough came as a result of committed support from donors and the introduction of DOTS as the preferred treatment approach. For the national TB programme, securing medium-term financial stability – first through its collaboration with JICA and subsequently through the Global Fund to Fight AIDS, Tuberculosis and Malaria – has enabled it to decentralize its control activities to the health centre level. In collaboration with NGOs it has further decentralized these to the community level. As a result of exposure to successful DOTS implementation in other countries and early success in local DOTS trials, the insistence on providing inpatient care has been relaxed, and the broadening of DOTS training to other hospital and health centre staff has mainstreamed TB management. The models of funding used have shifted incentives from hospitalization to community-based delivery, while protecting the diagnostic and supervisory functions of the TB units. The result has been a realignment of TB control under the health coverage plan and improved communication with health ministry planners, both through the ministry's Coordinating Committee and coordination mechanisms of the Global Fund. The minimum package of activities has been adapted to include DOTS delivery, and the presence of diagnostic microscopy in selected health centres has been tacitly accepted. Free provision of TB services has been maintained in the context of the introduction of user fees for other clinical and preventive services. The Ministry of Health is now focusing on improving the quality of health services – including DOTS – and on extending its investment through loans from the Asian Development Bank to allow it to contract district-level services. This rapprochement (and the shared resources provided through the Global Fund to Fight AIDS, Tuberculosis and Malaria) has enabled further collaboration with Cambodia's National Centre for HIV/AIDS, Dermatology and Sexually Transmitted Diseases, including implementing joint programmes to address the interface between HIV and TB.

While Cambodia's national TB programme appears well-positioned to meet and maintain its goals – 100% DOTS coverage at health centre level, 70% smear-positive case-detection and an 85% treatment success rate – several points of inherent vulnerability remain. Despite a growing economy and an increased budget allocation for the Ministry of Health, the national TB programme remains heavily dependent on donors to ensure continuing and uninterrupted drug supplies and its community mobilization and case-detection activities. The engagement of multiple donors provides some flexibility, but JICA has had to provide bridging funding to guarantee continued services when disbursements from other sources have been delayed.

The Cambodian experience provides valuable lessons for TB programmes operating in the least-developed countries, particularly in the context of health sector reforms. The first clear need is to ensure stable funding for the period of structural change as well as ensuring continued technical support. There is also a need for greater exposure to international

developments in TB control in order to raise local awareness of options and how these might be integrated into changing health structures. The third imperative is to ensure the ongoing engagement of managers of the national TB programme in the broader reform process to ensure that the essential elements of TB control are integrated into the restructured health services. While local leadership is crucial, there is a transitional role for development assistance both in terms of resources and, more importantly, in providing access to an international community of technical and organizational support. ■

Funding: This research was supported by the University of Queensland Travel Scheme for International Collaborative Research and the JJ Billings Overseas Travelling Fellowship of the Royal Australasian College of Physicians.

Competing interests: None declared.

Résumé

Résistances au renouveau : conflits entre la réforme du secteur de la santé et le programme national cambodgien de lutte contre la tuberculose

Après l'effondrement des infrastructures sanitaires cambodgiennes pendant la période des Khmers rouges (1975-1979) et la décennie de sanctions des Nations Unies qui a suivi, l'aide au développement internationale s'est focalisée sur la reconstruction du système de santé du Cambodge. La forte charge de tuberculose observée dans ce pays et la disparition des actions de lutte antituberculeuse pendant la transition vers la démocratie ont incité à relancer le programme national de lutte antituberculeuse vers le milieu des années 1990, lors de l'introduction des réformes du secteur sanitaire appuyées par l'OMS. Le présent article étudie les conflits entre les réformes du système de santé et les programmes de lutte antituberculeuse dus aux différences dans leurs schémas de fonctionnement. Il examine aussi comment de telles tensions ont été résolues lors de l'introduction de la stratégie DOTS pour le traitement de la tuberculose.

Resumen

Resistencia y renovación: reforma del sector sanitario y programa nacional contra la tuberculosis en Camboya

Tras la destrucción de la infraestructura sanitaria de Camboya durante el periodo de los jemeres rojos (1975-1979) y el decenio subsiguiente de sanciones de las Naciones Unidas, la asistencia internacional para el desarrollo se ha centrado en reconstruir el sistema de salud del país. El reconocimiento de la enorme carga de tuberculosis que sufre Camboya y el debilitamiento de las estrategias de control de esa enfermedad durante la transición a la democracia propiciaron el relanzamiento del programa nacional contra la tuberculosis a mediados de los años noventa, coincidiendo con la introducción de reformas del sector sanitario respaldadas por la OMS. En este artículo se examinan los conflictos surgidos entre las reformas sanitarias y los programas de control de la tuberculosis como consecuencia de sus diferentes paradigmas de funcionamiento. Se analiza también la manera en que se resolvieron esas tensiones durante la aplicación de la estrategia DOTS de tratamiento de la tuberculosis.

ملخص

المقاومة والتجديد: إصلاح القطاع الصحي والبرنامج الوطني لمكافحة السل في كمبوديا

في أعقاب تدمير البنية الأساسية للنظام الصحي في كمبوديا إبان فترة حكم الخمير الحمر (1975 – 1979)، والعقد الذي تلا هذه الفترة وفرضت فيه الأمم المتحدة عقوبات على كمبوديا، تركزت المساعدة الإنمائية الدولية على إعادة بناء النظام الصحي للبلد. وقد أدى إدراك العبء الثقيل للسل على كاهل البلد، وانهيار استراتيجيات مكافحة السل في فترة التحول إلى الديمقراطية، إلى إعادة إطلاق البرنامج الوطني لمكافحة السل في منتصف تسعينات القرن الماضي، حيث بدأ تنفيذ إصلاحات القطاع الصحي بدعم من منظمة الصحة العالمية. وتتناول هذه الورقة التضارب الذي نشأ بين أنشطة إصلاح القطاع الصحي وبين برامج مكافحة السل، بسبب اختلاف الإطار النظري لإدارة كل منهما. كما تناقش هذه الورقة كيف تمت تسوية هذه التوترات عند إدخال استراتيجية المعالجة القصيرة الأمد للسل تحت الإشراف المباشر.

References

1. Programme Nationale Tuberculose. *TB-94: L'urgence* [TB-94: Emergency]. Phnom Penh: Ministère de la Santé, Royaume du Cambodge, 1994 :8.
2. Heng MB, Key PJ. Cambodian health in transition. *BMJ* 1995;311:435-7.
3. *Guide for strengthening the district health system in Cambodia*. Phnom Penh: Planning and Statistics Unit, Ministry of Health; 1995.
4. Global Fund to Fight AIDS, Tuberculosis and Malaria. *Cambodia and the Global Fund. Grant TB: round 2*, 2007. Available at: http://www.theglobalfund.org/programs/grantdetails.aspx?CountryId=CAM&compid=34&grantid=201&lang=
5. Volkmar-André J. Medical care inside Kampuchea. In: Levy BS, Susott DC, eds. *Years of horror, days of hope: responding to the Cambodian refugee crisis*. Millwood: Associated Faculty Press; 1986:273-85.
6. Lanjouw S, Macrae J, Zwi A. Rehabilitating health services in Cambodia: the challenge of coordination in political emergencies. *Health Policy Plan* 1999;14:229-42.
7. Godfrey M, Chan S, Kato T, Long VP, Pon D, Tep S, et al. *Technical assistance and capacity building in an aid-dependent economy: the experience of Cambodia*. Phnom Penh: Cambodia Development Resource Institute; 2000: 16-17. (Working Paper 15.)

8. Benson C. *The changing role of NGOs in the provision of relief and rehabilitation assistance. Case study 2: Cambodia/Thailand*. London: Overseas Development Institute; 1993:70-91. (Working Paper 75.)
9. Desbarats J. *Prolific survivors: population change in Cambodia 1975-1999*. Tempe: Arizona State University Program for Southeast Asian Studies, 1995.
10. Unger J-P, Criel B. Principles of health infrastructure planning in less developed countries. *Int J Health Plann Manage* 1995;10:113-28.
11. Van Lerberghe W, Lafort Y. *The role of the hospital in the district: delivering or supporting primary health care?* Geneva: Division of Strengthening of Health Services, WHO; 1990 (WHO/SHS/CC/90.2).
12. Unger J-P, Dujardin B. Epidemiology's contribution to health service management and planning in developing countries: a missing link. *Bull World Health Organ* 1992;70:487-97.
13. Jeppsson A. SWAp dynamics in a decentralised context: experiences from Uganda. *Soc Sci Med* 2002;55:2053-60.
14. Apted, M. Record of the symposium: session 1. In: *International symposium: TB/HIV in Cambodia*. Phnom Penh: CENAT/JICA National TB Control Project; 2000:15-18.
15. Norval P-Y, Kong KS, Team B, Dy NR, Anh DI, Blanc L. DOTS in Cambodia. *Int J Tuberc Lung Dis* 1998;2:44-51.
16. Cambodia. *Review of health coverage plan: issues and strategies*. Phnom Penh: Ministry of Health; 2002.
17. *The effects of health reform strategies on utilization and income of first line facilities: a report on the health centre assessment study*. Phnom Penh: Ministry of Health; 2000.
18. *Joint health sector review: main findings, issues and options*. Phnom Penh: Joint Health Sector Review; 2001;8.
19. National Centre for Tuberculosis and Leprosy Control (CENAT). *National health strategic plan for tuberculosis control 2001-2005*. Phnom Penh: CENAT; 2001:11.
20. *Tuberculosis report 2005*. Phnom Penh: National Centre for Tuberculosis and Leprosy Control; 2006.
21. *Global tuberculosis control: surveillance, planning, financing*. WHO report 2003. Geneva: WHO; 2003:66-8 (WHO/CDS/TB/2003.316).
22. National Centre for Tuberculosis and Leprosy Control (CENAT), Cambodia. *Report: national TB prevalence survey, 2002, Cambodia*. Phnom Penh: CENAT; 2005:40.
23. Wilkinson D. Tuberculosis and health sector reform: experience of integrating tuberculosis services in to the district health system in rural South Africa. *Int J Tuberc Lung Dis* 1999;3:938-43.
24. Bosman MCJ. Health sector reform and tuberculosis control: the case of Zambia. *Int J Tuberc Lung Dis* 2000;4:606-14.
25. Hanson C, Kibuga D. Effective tuberculosis control and health sector reforms in Kenya: challenges of an increasing tuberculosis burden and opportunities through reform. *Int J Tuberc Lung Dis* 2000;4:627-32.
26. Ruffino-Netto A, de Souza AM. Evolution of the health sector and tuberculosis control in Brazil. *Rev Panam Salud Publica* 2001;9:306-10.