

Collaboration between private pharmacies and national tuberculosis programme: an intervention in Bolivia

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Summary

BACKGROUND Public–private partnerships are felt to be necessary for tuberculosis (TB) control in some developing countries.

OBJECTIVES To evaluate the potential of a collaboration between the National TB Programme (NTP) and private pharmacies in Bolivia, the country with the highest TB incidence in Latin America.

METHODS We contacted the local Pharmacists' Association in the city of Cochabamba, and designed a two phase intervention. The objectives of the first phase were to decrease the availability of TB drugs in private pharmacies on a voluntary basis, and to improve referral of clients seeking TB drugs to the NTP. A survey of all pharmacies allowed for a before–after comparison with a baseline survey. The objectives of the second phase were to obtain referral of pharmacy clients with chronic cough for TB screening in the NTP. This phase was started in 70 pharmacies and evaluated after 2 months using the referral slips issued by the pharmacists.

RESULTS The proportion of pharmacies selling TB drugs decreased (rifampicin: 23–11.5%; isoniazid: 16–3.1%; $P < 0.001$) and the proportion of pharmacies referring to the NTP clients seeking TB drugs increased (22–58%; $P < 0.0001$). In the second phase, 26 of 70 pharmacies (38%) referred a total of 41 clients for screening in the NTP (i.e. an average of 0.29 clients per pharmacy and per month); 11 of 41 (27%) were screened and three of 11 (27%) diagnosed with smear-positive TB.

CONCLUSION The first phase of the intervention proved effective in reducing the availability of the main TB drugs in pharmacies, and in improving referral of clients seeking TB drugs. Key factors in this success were not specific to Bolivia, and collaboration between private pharmacies and public services appears possible in that respect. However, collaboration with pharmacies does not seem an efficient way to increase the number of patients screened for TB, and to shorten delays to TB diagnosis and treatment.

keywords tuberculosis, tuberculosis control private sector, public-private partnership pharmacies, Bolivia

Introduction

Following findings of both a substantial tuberculosis (TB) caseload, and unsatisfactory management practices in the private health sector, public–private partnerships are now considered necessary for TB control in several high prevalence countries (WHO 2001). However, reports of such public–private collaborations are still scarce, and mostly limited to private practitioners in Asian countries such as India (Murthy *et al.* 2001) and Nepal (Newell *et al.* 2004).

The TB patients seeking health care in the private sector generally need to buy their TB drugs, but they are unlikely to buy the costly treatment for the required 6–8 months. In Nepal, 88% of the pharmacists in a survey said that their clients rarely bought TB drugs for

more than a week at a time (Hurtig *et al.* 2000). In India, 50–60% of clients buying TB drugs in a private pharmacy did so on a daily basis, due to lack of money, and private pharmacies have been called 'a neglected link in TB control' (Rajeswari *et al.* 2002). Incomplete treatment does not cure the disease, and causes unnecessary expense to already poor patients. It also carries the risk of developing resistance to the main tuberculostatics. Multidrug-resistant TB (defined as resistance to at least isoniazid and rifampicin) is a man-made problem. On the other hand, because TB patients often visit a pharmacy at an early stage of their disease (before being diagnosed), it has been argued that pharmacies could play an important role in the early detection of TB cases (Lonnroth *et al.* 2003).

Bolivia has the highest TB incidence rate in Latin America – estimated to 234 per 100 000 in 2002 (WHO 2004) – a relatively well-functioning National TB Control Programme (NTP), and a large private health sector. In Cochabamba, the third largest city of the country, we surveyed the availability of TB drugs in a systematic sample of 100 private pharmacies in February 2001 and subsequently made contacts with the local Pharmacists' Association (ASPROFAR) to present the results and propose a collaboration (Lambert *et al.* 2004), which is discussed and evaluated here.

Methods

First phase of the collaboration: the 'TB drugs' intervention

The objectives of this intervention were to decrease inadequate TB treatment in the private health sector by decreasing TB drug availability in private pharmacies, and improving referral to the NTP of clients seeking these drugs. The intervention is outlined in Box 1.

In May 2002, we conducted a survey of all pharmacies in Cochabamba on the basis of a combined list elaborated from the list of ASPROFAR members and the list of registered pharmacies in the Departmental Health Services. We used the 'simulated client method' as in the 2001

Box 1 Collaboration between departmental health services and private pharmacies in Cochabamba (phase 1: the TB drugs intervention)

Project team (researchers, NTP, and the person-in-charge of pharmacies' registration and control within the departmental health services) discusses possible interventions to decrease TB drug sales in private pharmacies. After much discussion, collaboration with pharmacies, rather than coercion, identified as the only possibility

Project team contacts the president of the Pharmacists' Association (ASPROFAR); a proposal to jointly address the problem is well received

Various meeting with a core group of ASPROFAR members (president, vice-president, secretary) permit to develop lines of action and to prepare a general meeting with all affiliated pharmacies

170 pharmacists (50% of the ASPROFAR members, 40% of all pharmacies in town) attend the general meeting. A presentation is given on TB control, NTP and potential consequences of incomplete TB treatment. Pharmacists appear favourable to a voluntary moratorium on TB drugs sales

August 2001: ASPROFAR issues a recommendation to its members to stop selling TB drugs and to refer clients seeking these drugs to public services

TB, tuberculosis; NTP, National TB Programme.

baseline survey (Lambert *et al.* 2004). Surveyors pretending to be clients presented in the pharmacies with a medical prescription for rifampicin (300 mg) isoniazid (150 mg), ethambutol (400 mg) and pyrazinamid (500 mg); no fixed-drugs combinations were available at that time in Bolivia. Surveyors bought the drugs that were proposed, and recorded them. On rare occasions rifampicin was available in the pharmacy but the pharmacist refused to sell it to a client with an obvious TB prescription; this was noted as 'available, but not sold'. For drugs bought we did not analyse whether the dosage matched the prescription.

If the prescription could not be entirely filled (four drugs), the surveyors asked: 'Where could I find these drugs?' and later recorded whether they had been advised to go to another pharmacy, to the public health services (these pieces of advice were not mutually exclusive), or if no advice had been provided.

Analysis was done using STATA 8.0; we tested statistical difference between results of the 2001 and the 2002 survey with a logistic regression for survey data, incorporating the effect of clustering (cluster: pharmacy occurring in both surveys) and the finite population correction. Confidence intervals for the relative difference in percentages between the first and the second survey were calculated with the Delta method.

Second phase of the collaboration: the 'TB screening' intervention

The objectives of this intervention were to shorten delays to TB diagnosis, and to increase TB case detection in the NTP, through referral for TB screening in the NTP, of pharmacy clients with chronic cough. The intervention is described in Box 2.

Box 2 Collaboration between departmental health services and private pharmacies in Cochabamba (phase 2: the TB screening intervention)

Encouraged by phase 1 success, project team and ASPROFAR core members together designed phase 2 intervention. Pharmacists were to refer clients with chronic cough to NTP, and to issue a referral slip to all their referred clients. Staff from each of the 18 first line public health centres in the city identified in its immediate neighbourhood three or four pharmacies (members of ASPROFAR) with a high volume of clients and visited them to obtain collaboration. A meeting called by ASPROFAR brought together the pharmacies selected, the research team, and the district health coordinators, to discuss implementation. A total of 70 pharmacies were included in the project that lasted 2 months between January and March 2002.

TB, tuberculosis; NTP, National TB Programme.

Results

Phase 1: The 'TB drugs' intervention

Of 449 pharmacies in our combined list, 359 (80%) were surveyed (90 had either closed down, moved, changed name, or could not be found); 24 additional pharmacies (not in the list) were fortuitously encountered by the surveyors in the field, and were also included. In this total of 383, only 75 pharmacies could retrospectively be matched to one of the 100 pharmacies in the baseline survey. Comparison of the availability of drugs and attitude of pharmacists before and after the intervention is shown in Table 1. As rifampicin is being used for purposes other than TB in Bolivia, we also report the proportion of pharmacies selling only rifampicin (as opposed to rifampicin with any other TB drugs).

Phase 2: The TB screening intervention

Based on the referral slip, we computed that 26 of 70 pharmacies (38%) referred a total of 41 clients for screening in the NTP (an average of 0.29 clients per pharmacy and per month); 11 of these (27%) were screened and three were (27%) diagnosed with smear-positive TB (an estimated 5% of case finding in the NTP for the study period in the area). These results occurred despite close follow up (in the form of meetings with ASPROFAR and public health services). It was decided not to extend the project to all the pharmacies in the city. Systematic monitoring of the intervention was discontinued.

Discussion

Availability of TB drugs in private pharmacies, and referral of TB drug clients

None of the lists of pharmacies we used to create our sampling frame was up-to-date, but we can estimate that more than 80% of all pharmacies in Cochabamba were included in the survey. There is, however, no reason to believe that this incomplete coverage did result in any serious selection bias. Indeed, pharmacies escaping registration supposedly are small ones; on the other hand, TB drugs have a low turnover and are more likely to be found in bigger pharmacies with a high volume of clients.

The overall availability of rifampicin decreased by half, although not in the subsample of pharmacies not selling any other TB drugs, suggesting that in these pharmacies it is sold mainly for non-TB use. To limit the risk of developing resistance, rifampicin should in theory be reserved for TB treatment. In Saudi Arabia, where it is widely prescribed and dispensed for non-TB use, the rate of rifampicin resistance is extremely high and contrasts with low resistance to ethambutol and isoniazid which cannot, by law, be dispensed in private pharmacies (Al Hajjaj *et al.* 2001). But the problem of excessive use of rifampicin for non-TB indications needs to be tackled with prescribers, not with pharmacists. Our intervention should have tried to persuade pharmacists not to sell rifampicin to clients with a TB drugs prescription, rather than not to sell rifampicin at all. Indeed losing (non-TB) clients could be a disincentive for pharmacists to comply with all the recommendations. The most dramatic decrease

Table 1 Availability of TB drugs in private pharmacies and attitude of pharmacists before and after the intervention

	Before intervention, 2001 survey (N = 100)		After intervention, 2002 survey (N = 383)		Difference 2002 – 2001		
	n	%	n	%	%	95% CI	P-value
<i>Availability of TB drugs</i>							
Pharmacies with							
Rifampicin (R)	23	23.0	44	11.5	-50	-67 to -33	<0.0001
R, but no other TB drug	8	8.0	31	8.1	+1	-60 to -62	0.97
R with any other TB drug	15	15.0	13	3.4	-77	-88 to -67	<0.0001
Isoniazid (H)	16	16.0	12	3.1	-80	-89 to -72	<0.0001
Ethambutol (E)	5	5.0	11	2.3	-43	-88 to +3	0.15
Pyrazinamid (Z)	1	1.0	7	1.8	+83	-238 to +403	0.50
H or E or Z	17	17.0	16	4.2	-75	-86 to -65	<0.0001
Four drugs	1	1.0	4	1.0	+4	-181 to +190	0.96
<i>Attitude of pharmacists</i>							
Pharmacists that							
Referred to another pharmacy	59	59.0	103	26.9	-54	-62 to -47	<0.0001
Referred to public services	22	22.0	222	58.0	+163	+77 to +250	<0.0001

CI, confidence interval; TB, tuberculosis.

was in the availability of isoniazid, the cheapest and least profitable TB drug. Pyrazinamid is being imported only by the NTP in Bolivia, and its presence in private pharmacies indicates acquisition by way of illicit means. This was not, it seems, vulnerable to an intervention appealing to good intentions. TB drugs sales in private pharmacies seem to have been slowly decreasing in recent years in Bolivia, parallel to improved NTP visibility and coverage (Lambert *et al.* 2004); our intervention most probably only accelerated an existing trend. However, a very significant achievement is that 58% of the pharmacies (against 22% before the intervention) referred their simulated client to public health services. In effect, this would prevent clients from seeking TB drugs in other pharmacies, where they might eventually find them.

Interventions for retail pharmacies in developing countries can be based on information, persuasion, incentives, or coercion (Goel *et al.* 1996). Ours was based on persuasion: information was given during the meeting with ASPROFAR on TB control and the potentially harmful consequences of inadequate TB treatment. No direct incentive was provided, but pharmacists welcome collaboration with the public services as an opportunity to improve their image as fully fledged health professionals. No coercion could have been used, given the permissive legal framework for TB drug sales in retail pharmacies in Bolivia.

Key issues in the success of this first phase of the collaboration are not particular to Bolivia. First, TB drugs contribute little to the overall income of retail pharmacists, because in absolute terms, TB is a relatively rare disease (two per 1000 representing a 'high incidence'). Free treatment in the public sector also reduces the private market. In Vietnam, a 'high TB burden country' (WHO 2004), private pharmacists reported an average of only 1.3 (95% CI: 0.6–1.9) clients for TB drugs per month (Lonnroth *et al.* 2000). Secondly, pharmacies in many middle-income countries like Bolivia are – to some extent – regulated and controlled: pharmacists in Cochabamba would have attended a meeting called by the departmental health services to propose this collaboration. In this context, the existence of a well-organized Pharmacists' Association certainly eased the negotiations, but was not crucial. What was crucial was the open and friendly atmosphere in which negotiations were conducted. Last but not least, such an intervention requires a relatively well functioning NTP with adequate coverage, and the ability to offer a proper alternative to TB treatment in the private sector. TB drug shortages are nowadays uncommon in the Bolivian NTP.

Referral of clients with chronic cough

In contrast to the first phase of the project, the second phase was not considered successful. Each pharmacy

referred for screening on average 0.29 clients per month. Although we cannot have a precise estimation of the exact number of clients who were suffering from chronic cough, it must have been much higher. Probably more could have been referred, but after all pharmacists do not systematically become aware that their clients suffer from chronic cough.

Only 11 of 41 patients referred (27%) went for TB screening as advised. Unsolicited advice from pharmacists might not be sufficient to persuade the targeted clients to go to the NTP. Motivation for screening (as opposed to motivation for diagnosis) is often low because most of the patients screened do not suffer from the disease (8% of patients screened for TB are smear-positive in Bolivia), and pharmacists do not have the credibility a doctor would have giving the same advice. Moreover, a client sent by a pharmacist to the public health services in Bolivia still needs to pay a consultation fee (although the sputum test itself is free). Therefore, only those with more pronounced symptoms might indeed be willing to present for screening. It was suggested to waive the consultation fee for patients referred by the pharmacies. This of course would be unfair to the other patients and would have created a perverse incentive for patients to go first to a pharmacy – not even to mention the difficulties of practical implementation.

The proportion of smear-positive TB among clients screened was high (three of 11, 27%), suggesting that pharmacies referred clients with more advanced symptoms of TB, and/or indicating self-selection from the part of the clients accepting referral as said earlier. The objective of 'early case detection' was not achieved. There was indeed some confusion among pharmacists between 'a client who should be screened for TB' (client with chronic cough) and a 'client who looks like he might have TB' (presenting more advanced symptoms).

The increase in smear-positive TB case-detection after 2 months of monitoring 70 pharmacies (three patients), was about 5% in the NTP during the study period in the area. Although only 70 pharmacies had been involved ($\pm 20\%$ of all pharmacies in town) these had been selected among pharmacies with the highest volume of patients in an attempt to target the intervention. The increase in TB case-detection did not meet expectations, and after systematic analysis of the data we concluded that the effort needed to increase TB case-detection with this intervention would be better invested elsewhere.

In Vietnam, a similar intervention involving the monitoring of 150 pharmacies over 9 months contributed 1% of the total case detection of smear-positive TB in the NTP during that period (Lonnroth *et al.* 2003) despite the fact that financial incentives were provided to pharmacists. Contrary to the authors of the Vietnamese study we

M. L. Lambert *et al.* **Private pharmacies and the national TB programme in Bolivia**

reached the conclusion that such an intervention was not an efficient way to increase TB case finding and shorten delays to TB diagnosis and treatment. In view of long delays to TB diagnosis and treatment observed in patients attended in the private and the public health sector in Bolivia (M. L. Lambert *et al.*, manuscript submitted), it would probably be more worthwhile to concentrate on doctors, rather than pharmacists.

But the first phase of the intervention proved effective in reducing the availability of the main TB drugs in the private sector, and in improving referral of TB patients to the public services. This intervention was simple and (apart from the surveys required for its evaluation) did not require many resources, as it consisted only in a few meetings with the Pharmacist's Association. Key factors in its success were not specific to Bolivia. Collaboration between private pharmacies and public services in that respect appears possible and offers a largely untapped potential.

Acknowledgements

This study was funded by the Belgian Directorate General for Development Cooperation. Authors also thank Ms Ana-Maria Aguirre, ASPROFAR president, Ms Clara Fernandez from the NTP in Cochabamba, key actors in this intervention, Dr Henry Pardo and Dr Faustino Torrico in IIBISMED, for their useful contribution and M. Deogratias Mazina for his help in analysing the data.

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