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# Implementing global knowledge in local practice: a WHO lung health initiative in Nepal

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Clinical practice guidelines are used widely to improve the quality of primary health care in different health systems, including those of low-income countries. Often developed at international level and adapted to national contexts to increase the feasibility of effective uptake, guideline initiatives aim to transfer global scientific knowledge into local practice. The WHO's Practical Approach to Lung Health (PAL) is an example of such an initiative and is currently being developed to improve the quality of care for youths and adults with respiratory diseases.

We assessed ex-ante the feasibility of successful implementation of PAL in a pilot programme in rural Nepal, studying three components: the quality of the innovation (i.e. the guidelines), the effectiveness of the implementation strategy (i.e. training) and the receptiveness of the social system of health staff at all levels (i.e. social and organizational characteristics). We assessed the guideline innovation with the AGREE instrument for guidelines, the intended implementation strategy by critical comparison with literature on effective strategies, and the social system with both a stakeholder analysis and a descriptive analysis of the health care system at district level.

This ex-ante assessment of an adaptive local implementation of international WHO guidelines showed that in July 2002 the 'implementability' of the package was challenged on the three components studied. To increase the chances of successful implementation, the national guideline development process should be improved and the implementation strategy needs to be upgraded. In order to successfully transfer global knowledge into local practice, we need to develop additional multifactorial sustained interventions that tackle other culture-specific and health system-specific barriers as well. The primary health workers are key informants for these barriers.

**Key words:** quality of care, implementation, guidelines, stakeholder analysis, social system, low-income countries, Nepal

## Introduction

Multilateral efforts to improve the quality of primary health care in varying national systems often include the development and introduction of standard clinical practice guidelines. This process typically starts out with the development of generic tools at global level, as can be seen in a variety of programmes for essential drugs and disease control (Ross-Degnan et al. 1992; Gove 1997; WHO 2002b). The tools are not health system-specific and hence, the potential for instantaneous implementation in many health systems is limited. Consequently, generic tools are meant to be adapted to the specific local context. Overall, the ultimate challenge lies in transferring global scientific knowledge into local practices. In low-income countries in particular, these circumstances are frequently characterized by a chronic lack of sufficiently competent health workers and other limited resources.

Success or failure in the promotion of changes in clinical practice in developed countries with well-trained professionals depends on the characteristics of the implementation process (Wensing et al. 1998; Woolf et al. 1999; Grimshaw et al. 2001). Given the multitude of international initiatives and further globalization of efforts, there is a need for more systematic study of how generic guidelines are implemented through national health systems in developing countries.

**Box 1.** Description of generic and Nepal-specific PAL guidelines development

The global, *generic PAL guidelines* were designed and developed at supranational level by expert panels on the initiative of WHO in 1997–98 (Scherpbier et al. 1998). The guidelines contains algorithms that follow a syndromic approach to disease. Primary care health workers with little training in lung health receive guidelines that comprehensively cover respiratory disease case management. The guidelines guide the health worker stepwise through the assessment of a patient and result in a classification. A specific classification leads to specific management and, if necessary, to treatment. The clinical algorithms are presented as flow-charts in topic specific modules. The complete document is 60 pages in length and includes recommendations for follow-up and counselling. Expected outcomes include an increase in rational use of drugs, adequate referrals, shortening of delay in tuberculosis diagnosis and treatment, decrease in number and severity of asthma attacks in chronic patients.

The local, context-specific *PAL-Nepal* adaptation and implementation on the basis of the generic PAL guidelines started in November 1999. Nepalese experts and potential stakeholders from the national, regional, district and local health system participated in the Adaptation Working Group (AWG) to produce context-specific PAL guidelines. Among the 23 participants were 18 senior health officials representing governmental health offices, clinical departments of tertiary hospitals and academics. Five participants represented the peripheral health care level: two district health officers, two hospital-based health workers and one health worker from a primary health care centre. The AWG focused its work on the treatment of diseases and specifically addressed the perceived problems with recommended drug therapies in the generic guidelines. Their findings and suggestions were presented in October 2001 (Mattousch 2001b). This concluded the adaptation into the PAL-Nepal guidelines, which were now ready for their first pilot implementation which started in July 2002 in the rural lowland district of Nawalparasi.

This paper takes the example of the 'Practical Approach to Lung Health' (PAL),[1] a World Health Organization (WHO) initiative to improve the syndromic management of lung diseases in youths (over 5 years of age) and adults in middle- and low-income countries (WHO 2002a). PAL is presented as a package that consists of generic clinical practice guidelines and accompanying training materials. It targets the multi-purpose health worker at peripheral primary and secondary care facilities. In several countries, elements of PAL are currently being field tested and evaluated (WHO 2003).

In Nepal, the global, generic PAL package was adapted to the specific Nepalese health care context as part of the guideline development process and also to facilitate its further introduction (Box 1) (Bentley 1995; His Majesty's Government of Nepal 2001; Bishai et al. 2002; Adhikari and Maskay 2004). A pilot implementation of the adapted PAL package, called PAL-Nepal, started in governmental primary health care centres, health posts and sub-health posts of Nawalparasi, a rural lowland district (Figure 1). The pilot implementation of PAL-Nepal is subject to an evaluation of effects, including costs, organizational effects and health outcomes, using a cluster randomized trial design. Also, it is subject to a qualitative assessment of the development and implementation process itself.

This article presents the latter of the two studies and answers the research question: 'What are the chances of successful implementation of PAL-Nepal given the characteristics of the guidelines, the planned implementation strategy and the social system?'.

The study was carried out by external researchers (AtA, LN, CvdH) who were observers during PAL-Nepal activities and had no active involvement in its development and implementation.

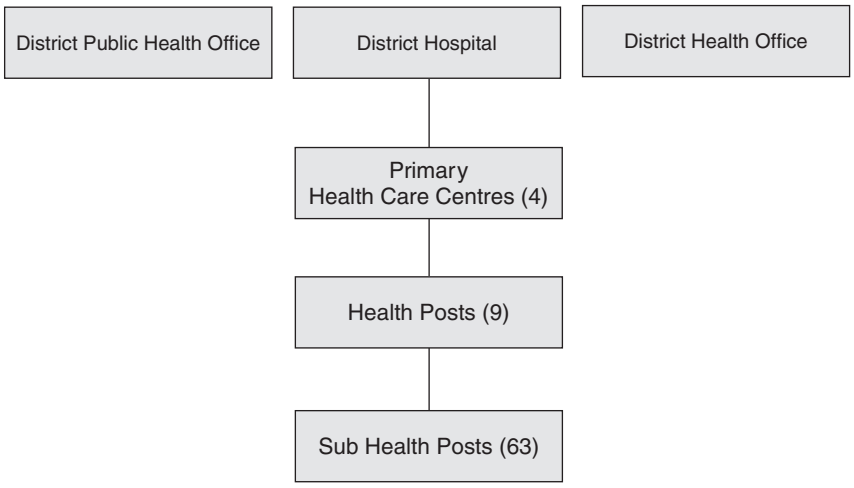
## Methods

Adapted from Rogers (1995), we identified and assessed three components in the development and implementation process of PAL-Nepal: the innovation (the guidelines), the implementation strategy (training), and the social system (the social and organizational context of health workers at the various levels in the Nepalese health care system). We perceived that successful implementation depends on the quality of the innovation itself, the effectiveness of the implementation strategy and the receptiveness of the social system, in conjunction with each other. The first two components are elements of the new health policy and the latter determines the context for adoption and diffusion. For each component we selected specific assessment instruments.

### Assessment of innovation

We used the generic and standardized Appraisal of Guidelines Research & Evaluation (AGREE) Instrument (The AGREE Collaboration 2001) to assess whether the guidelines could be expected to be effective in producing the desired changes in outcomes. The AGREE instrument appraises the methods used for developing the guidelines, the content of the final recommendations, and the factors linked to their uptake.

The material for this assessment consisted of the background documents for the generic PAL clinical practice guidelines (Pio and Chaulet 1997; Scherpbier et al. 1998), the minutes of the Adaptation Working Group (AWG)




At the sub-health posts (SHPs), three posts for health workers are sanctioned: one auxiliary health worker (AHW), one maternal and child health worker (MCHW) and one village health worker (VHW). AHWs have 2 years of professional training. MCHWs and VHWs have less training and are not qualified to treat adults. Their activities focus on disease prevention and health promotion. Health posts (HPs) and primary health care centres (PHCCs) employ the same professionals and in addition health assistants (HAs) and auxiliary nurse midwives (ANMs). In all four PHCCs, a sanctioned post for a medical officer was vacant. In general, HPs and PHCCs have more sanctioned posts and higher educated health workers than SHPs.

**Figure 1.** Description of district health services in Nawalparasi

meetings held in Nepal (Mattousch 2001a,b), personal observation reports and the context-specific PAL-Nepal algorithms. Three independent reviewers familiar with developing and assessing clinical practice guidelines assessed the PAL-Nepal documents with the AGREE instrument. For multi-rater Kappa analysis, we used SPSS statistical software and additional macros (SPSS inc. 1997, 2000).

### Assessment of implementation strategy

For the implementation strategy, we established whether, given the available evidence from international literature, we expected the strategy offered to be effective. To assess this, we critically analyzed the planned implementation strategy using the framework suggested by Hulscher et al. (1999), which is based on evaluation research literature and theories on implementation and behaviour change, and on the data collection checklist developed by the Cochrane collaboration (Hulscher et al. 2001). Additionally, we compared the planned implementation strategy with characteristics of strategies that enhance effective implementation, as summarized by Grol and Grimshaw (1999, 2003), Grimshaw et al. (2001) and Hulscher et al. (2000).

Input for this analysis was derived from the minutes of the AWG meetings (Mattousch 2001a,b), training plans and training manuals.

### Assessment of the social system

Finally, we assessed the receptiveness of the social and organizational context of health workers at the various levels in the Nepalese health care system. We perceived the social system at national level foremost as a political system and carried out a stakeholder analysis to assess the feasibility of the political acceptance of PAL-Nepal (Reich 1995; Reich and Cooper 1997). For this analysis, three respondents (senior health officials) rated the stakeholders' position towards the PAL-Nepal goals and mechanisms, and the anticipated power of the stakeholders to influence the achievement of these goals.

In addition, we described factors at district and local level that influence the system's ability to take on central guidance. Input came from the literature, discussions with health care workers and personal observations during meetings at national and district/local level in 2001 and 2002 (AtA, LN, RS), the researcher's diary (AtA) and

e-mail communication during the research period 2000–2002 (LN, AtA), and field visits totalling 7 months over a period of 2 years.

*Time frame of assessment*

The first phase in the development and implementation of PAL-Nepal started in November 1999, building on the work of the international expert meetings that started the construction of the generic PAL package. It ended in July 2002, just before the actual introduction of the PAL-Nepal guideline package to the targeted health workers, which marked the start of the implementation phase. The time locus for this paper is 1 July 2002.

## Results

### Innovation

The results of the assessment of the PAL-Nepal guidelines with the AGREE instrument are shown in Table 1. The 'Comments of the reviewers' reflect the specific findings per item of the AGREE instrument. The inter-rater agreement was low: multi-rater Kappa was 0.29. We hypothesized that part of the variation could be explained by variation in 'agree' and 'strongly agree' or 'disagree' and 'strongly disagree'. The multi-rater Kappa for clustered answering categories 'agree' and 'disagree' was 0.65, confirming our hypothesis.

### Implementation strategy

Generic PAL training materials for a 5-day training course were developed at international level (by WHO) and adapted at national level (by WHO and the National Tuberculosis Centre). The National Tuberculosis Centre coordinated the adaptation and translation of all materials, and would conduct the training. The implementation strategy in PAL-Nepal consisted mainly of training of primary care health workers using a mix of classroom teaching and interactive elements including clinical practice and exercises. Participants received training documents, a copy of the algorithms – including an A4-sized decision-support tool – as well as a large, poster-sized copy of the algorithms. A critical analysis of the intervention, using the format proposed by Hulscher et al. (1999), is presented in Box 2.

Box 3 shows the comparison of the planned implementation strategy with four characteristics of strategies that are likely to enhance effective implementation.

### The social system: stakeholder analysis at national level

The stakeholder analysis revealed that the initiators of PAL-Nepal, the National Tuberculosis Centre and WHO, were the most supportive and powerful stakeholders in the pilot implementation in Nawalparasi. The complete list of potential stakeholders included 15 other international and national health care organizations and groups of professionals in the field of health care in Nepal. The respondents considered all these to be supportive of the implementation of PAL-Nepal but without having an interest or power to influence its implementation.

### The social system: characteristics at district and local level

Table 2 summarizes the potential barriers at district and local levels that were identified by the AWG and by WHO and PAL-Nepal partners, as well as suggestions made to address these barriers.

## Discussion

Our three-pronged assessment of the PAL-Nepal guidelines enabled a systematic study of the factors that are seen as important for a successful implementation. In the pilot stage of programme development, it identified potential complementary improvements in the guidelines formulation, a broader and more multifactorial implementation strategy, and some obstacles at district and facility levels.

### The innovation

The AGREE instrument indicated areas to improve the present version of the guidelines. First, although the scope and purpose of the guidelines was clearly stated, it could be more specific about demographic and geographic characteristics of the target population. Secondly, clarity and presentation were generally of high quality. In addition, the reviewers recommended an easily accessible, comprehensive guideline document that integrates the generic and Nepal-specific recommendations.

Thirdly, in the area of stakeholder involvement, it was recognized that the target users – health workers at health posts and sub-health posts – had not been involved in the development of the generic guidelines, nor in the adaptation process for PAL-Nepal. Likewise, patient views had not been incorporated in the development process of the guidelines. Their perspectives – for example, on the accessibility and use of facilities, or the cultural acceptability of treatments – could have identified potential barriers.

Fourthly, the low scores for applicability can partly be explained by the fact that the cost implications and organizational barriers have yet to be evaluated for the pilot implementation of PAL-Nepal. That does not explain, however, why PAL-Nepal lacked recommendations for monitoring and auditing. Some indicators for monitoring and audit of tuberculosis and asthma management were mentioned in the background document, but not for chronic obstructive pulmonary disease and pneumonia. Including such recommendations in the PAL-Nepal guidelines is helpful for health workers, supervisors and mid-level managers.

Fifthly, the score for rigour of development will increase when the link between the evidence base and the recommendations is clearly shown. The generic PAL guidelines referred to different national guidelines and

**Table 1.** Quality of PAL-Nepal guidelines by domain (The AGREE Collaboration 2001)

| Domain | Reviewers' comments | Summary domain score (0–100%) |
|---|---|---|
| *Scope and purpose*<br>(Overall aim of the guidelines, the specific clinical questions and the target patient population) | The overall objectives of the guidelines are described. The clinical questions covered by the guidelines are specifically described. The patients to whom the guidelines are meant to apply are described. The guidelines do not describe specifically the social and geographic characteristics of the target population. | 78% |
| *Clarity and presentation*<br>(Language and format of the guidelines) | The recommendations in the PAL-Nepal guidelines are specific and unambiguous, and the options for management of the condition are clearly presented. Alternative treatment options are rarely given. It is difficult to identify the key recommendations in this extensive document package. The guidelines are supported with tools for application. | 69% |
| *Stakeholder involvement*<br>(The extent to which the guidelines represent the views of their intended users) | The target users, i.e. health professionals from rural health facilities, did not participate in the development process. Professionals from higher professional groups were represented in the development groups of both the generic and country-specific guidelines. Patient views were not explicitly included in the guideline development process. The target users of the guidelines are clearly defined and the guidelines are piloted among target users. | 56% |
| *Applicability*<br>(The likely organizational, behavioural and cost implications of the guidelines) | The potential organizational barriers in applying the recommendations have been discussed in the generic guidelines document in a general manner. Specific mention of organizational barriers did not occur in the PAL-Nepal guidelines. The cost implications are the subject of study in the first pilot implementation of PAL-Nepal. At present the cost implications are unclear, yet are studied. The PAL-Nepal guidelines do not present key review criteria for monitoring and/or audit purposes. In the generic PAL guidelines, however, some outcome indicators for monitoring of asthma and tuberculosis management are mentioned. | 37% |
| *Rigour of development*<br>(Process used to gather and synthesize the evidence, the methods to formulate recommendations and to update them) | The guidelines are based on 'expert consultation' and literature research; it is unclear which criteria were applied for the selection of the underlying evidence. The design for the literature search is unclear. The process of decision-making after the expert consultation is not described. Recommendations are not explicitly linked to the evidence. Differences between recommendations in the generic guidelines and the PAL-Nepal guidelines are not explained. Strong focus on health benefits. Side effects and risks are not made explicit. External reviewers were involved in the process of adapting the generic guidelines into the country-specific guidelines. From the content, status and multitude of the different documents, it is obvious that the guideline package is still under construction. | 29%* |
| *Editorial independence*<br>(Independence of the recommendations and acknowledgement of possible conflict of interest from the guideline development group) | It is not stated whether the guidelines are independent from the funding body. Conflicts of interest of guideline development members (both generic and PAL-Nepal) have not been recorded in any of the studied documents. | 6% |

*Jefferson (2001) validated the treatment recommendations of the generic PAL package on the basis of available evidence. This report was not available to the PAL-Nepal Adaptation Working Group nor to the AGREE assessors and is therefore not included in their analysis.

**Box 2.** Critical description of the PAL-Nepal intervention, format proposed by Hulscher et al. (1999)

**Relevant elements of the intervention:**

Type of implementation strategy: **Professional intervention**

- Health workers at primary health care centres, health posts and sub-health posts are trained in using new clinical practice guidelines during a 5-day classroom course.
- Training materials can be used as decision tools (visual aids) in daily practice.
- Supervision visits by district health management are recommended.
- First year of intervention is combined with an effect evaluation study, involving daily non-participatory presence of research assistants in health facilities.

(1) **Flexibility** means the accepted *variation* (or standardization) in delivering the intervention (site to site/time to time).
   - The intervention appears not to be flexible and therefore may not be able to address variation in needs of learners.

(2) **Timing** includes the time interval between delivering the intervention and clinical decision-making (*proximity*) as well as the *number* and the *duration* of intervention events and time interval(s) between these events (*frequency*).
   - The intervention is a one-off 5-day course. Given turnovers in staff and uncertainty about how easy it will be for participants to take what they learn and apply it in their own settings without structural support, this is likely to be an important limitation.

(3) The **content** of the information consists of the *message(s)* (e.g. general or specific information on guidelines and/or performance, descriptive or graphical information), and its *comparability* (the possibility of comparing the received data on performance with those from others, or with standards).
   - Extensive written clinical practice guidelines for the management of respiratory diseases (tuberculosis, chronic obstructive pulmonary disease, asthma, pneumonia) containing specific recommendations in approximately 50 decision flowcharts, algorithms and text boxes. The volume and complexity of the algorithms are likely to be a limitation for swift uptake by the target users.

(4) The **medium** for delivering the message(s) can be, for example, oral, written, electronic, or a combination of these.
   - The course contains a mix of didactic and interactive training activities: oral presentations to explain the guideline and interactive sessions on clinical practice and exercises. One practical session is planned in a secondary care hospital, demonstrating assessment and classification of symptoms in admitted patients.

(5) The **sender** (deliverer) of the message has various characteristics, including his or her *profession* (also in relation to the *clinical problem*) and perceived *authority* (credibility, attractiveness, power).
   - The initiative for the intervention is taken by the World Health Organization.
   - The responsibility for implementing PAL-Nepal rests with the Ministry of Health, Department of Health Services and is delegated to the National Tuberculosis Centre.
   - The training of health workers is organized and facilitated by the National Tuberculosis Centre.
   - Trainers are qualified doctors and chest physicians from regional hospitals and are likely to be perceived as respected opinion leaders.

(6) The **receiver** of (or participant in) the intervention can equally be described by *profession (*also in relation to the *clinical problem*). The number (targeted and actual) of receivers and their *motivation to participate* (voluntary, compulsory, financial support) needs description. State also if the intervention was delivered to individuals or groups, including group size, and whether the receivers can learn from each other (*social interaction*).
   - Receivers are groups of primary care health workers with a mix of training levels: health assistants, auxiliary nurse midwives and auxiliary health workers, all employed by the Ministry of Health in primary health care centres, health posts or sub-health posts. The differences in qualifications were not reflected in the training.
   - Receivers attendance is compulsory and they receive financial benefits (per diem) during the course. Selection of the first batch of trainees is determined by the random selection of a first group of intervention facilities for the purpose of the effect evaluation research study.
   - Receivers interact during the course in a question and answer format. It is unclear from the training documents to what extent extend the interaction opportunities are likely to facilitate learning.

**Box 3.** Comparison of strategies that enhance effective implementation and PAL-Nepal's implementation strategy

- Multifaceted strategies seem more effective than single strategies (Grimshaw et al. 2001; Hulscher et al. 2001).
  PAL-Nepal:
  - Core strategy: 5-day training course;
  - Decision support tools are provided;
  - Supervision is recommended, implementation not yet planned.
- Multi-event strategies over a longer time period seem more effective than single-event strategies (Grimshaw et al. 2001).
  PAL-Nepal:
  - Single, one-off training course;
  - Supervision schedule yet unknown;
  - Visual aids distributed once might have continuous effect.
- Active strategies like workshops and in-practice training are more effective than passive strategies like classroom teaching (Grimshaw et al. 2001).
  PAL-Nepal:
  - Combination of classroom teaching and interactive training techniques involving clinical practice and exercises;
  - One practical session (patient demonstration) in secondary hospital.
- Analysis of barriers and facilitators, strengthening of facilitators and selecting effective measures for crucial barriers (Grol and Grimshaw 1999; Wensing et al. 1999).
  PAL-Nepal:
  - Potential barriers *related to drug treatment* were discussed and documented in adaptation phase by working group (Mattousch 2001a,b);
  - Occasional discussion of human resource barriers (personal observation).

**Table 2.** Barriers in the social system at district and local level, and the suggestions made of how to address them

| Barriers | Suggestions made to address the barriers |
|---|---|
| *Availability of drugs (identified by AWG)* | |
| • Drug supplies of listed essential drugs are supposed to last 6 months but part of the drugs usually ran out before that. | • No solutions were suggested. |
| • Some recommended drugs (e.g. salbutamol inhaler) are not listed in the Nepalese essential drug list. Consequently, these are not supplied by the government to the health facilities. | • The essential drug list would be upgraded for the Nawalparasi situation (Mattousch 2001a,b). Pending this matter the AWG was confident that the drugs would be available at local retail shops. |
| *Applicability of drug treatment (identified by AWG)* | |
| • Several specific recommendations in the generic PAL guidelines were considered inapplicable in the Nepalese context. For example, the dosage or form of drugs was not always available and possibilities to apply drugs intravenously were absent. | • Drug treatments were altered according to applicability in the context of SHP and HP. |
| • It was stated that 'there is definitely a resistance of health workers to use intramuscular drugs' (Mattousch 2001a). Explanations included the occurrence of complications and the fact that most health workers are not authorized to give intramuscular injections. | • The working group concluded that the PAL-Nepal training should address this perception. |
| *Human resources (identified by WHO, DHS and NTC)* | |
| • High staff turnover would be problematic, since there were no plans for training of newly appointed health workers. | • During the pilot implementation, staff transfers were minimized. No solutions were discussed for the situation beyond the first year. |
| • Absenteeism: at SHP the AHW is the only health worker qualified to attend to adults with respiratory complaints, but is also frequently absent (e.g. for training or meetings). In their absence, the MCHW attends to patients, although she is formally unqualified. | • Should MCHW be trained as well? No, the educational level of MCHWs was judged to be insufficient to attend the PAL training effectively. It was anticipated by WHO and partners that absenteeism of PAL-trained AHWs will be compensated by the dissemination of training materials and visual aids among non-trained staff in the health facilities. |

Abbreviations: AHW = auxiliary health worker; AWG = Adaptation Working Group; DHS = Department of Health Services; HP = health post; MCHW = maternal and child health worker; NTC = National Tuberculosis Centre; SHP = sub-health post.

international scientific papers. Most of these documents were made available to the AWG for PAL-Nepal. It is not mentioned to which recommendations the evidence was linked and what the evidence was for the adaptations made in Nepal. The recommendations made in the generic guidelines were validated *a posteriori* (Jefferson 2001). Unfortunately, the validation document was not available during the adaptation process in Nepal, or to the AGREE reviewers. There is substantial evidence in support of the generic PAL recommendations. Most evidence is from contexts in developed countries; hence, it is still informative to confirm this evidence in the context of developing countries. Evaluation of costs, organizational effects and health outcomes of PAL-Nepal – currently being carried out by an international consortium of researchers – is expected to reveal the health benefits and related cost of the PAL-Nepal guidelines.

Finally, background documents and the PAL-Nepal guidelines lacked a statement of editorial independence. It was not clearly stated whether the guideline developers might receive personal or institutional benefits from the recommendations.

The validity of the AGREE instrument in the Nepal context needs to be dealt with. The low inter-rater agreement might be related to characteristics of the AGREE instrument itself, PAL-Nepal or the Nepal context. AGREE is an appropriate instrument in the European context, where guidelines target health workers with a high level of education and address a limited area of clinical practice. In addition, algorithms can be used as an additional decision support tool that summarizes the main actions and recommendations. In PAL-Nepal, a set of algorithms is the core element and replaces a textual guideline document. In the case of less skilled health workers and the absence of specific reference manuals on respiratory diseases, the logical choice of the PAL developers has been the introduction of algorithms based on a pragmatic symptomatic approach. The generic background document (Scherpbier et al. 1998) is an extensive book containing a great deal of information that, according to one reviewer, 'one expects in a medical textbook rather than in a guideline'. The size of this document is not only an important obstacle in the implementation of PAL-Nepal, but it also might challenge the validity of AGREE.

The instrument does not assess the medical quality of the recommendations in the guidelines, nor does it assess whether basic conditions are met for introducing the guidelines, such as educational level of the health workers, drug availability and limited complexity of the algorithm. Also, the relative importance of the domains in AGREE might be unequal. For example, at sub-health post level a notification that the authors were not paid by pharmaceutical companies (editorial independence domain) seems a lesser priority than, say, a visually well-depicted algorithm with clearly stated recommendations (clarity and presentation domain). To better understand the applicability of the AGREE instrument in the context of developing countries, more case studies are needed.

### The implementation strategy

The discussion about effective implementations is ongoing and lively (Grol and Grimshaw 2003; Grol et al. 2003; Jamtvedt et al. 2003; Grimshaw and Eccles 2004; Grimshaw et al. 2004). We used this discussion to assess the effectiveness of an implementation strategy prospectively in a developing country. Our findings give some support to the hypothesis that the PAL-Nepal implementation strategy needs upgrading to become effective. In our critical analysis of this strategy as well as its comparison with the international literature, we identified potential areas for improvement.

Firstly, there is a body of evidence that training alone is not effective in changing clinical practice (Thomson O'Brien et al. 2001). The PAL mono-event strategy therefore needs expansion. It is likely that a multi-faceted and multi-events strategy will be more effective, for example, organizing multiple opportunities to learn and practice working with the guidelines. Recent studies, however, show that it might be more complicated than just adding more and different approaches (Jamtvedt et al. 2003; Grimshaw and Eccles 2004; Grimshaw et al. 2004). Studies in Nepal on effective strategies for improvement of primary health care will also provide useful suggestions (Kafle et al. 1997, 2001).

Secondly, analysis of implementation barriers was only documented as part of the guideline adaptation process, and more specifically the treatment recommendations in the generic guideline. The AWG members studied the applicability of these recommendations in the Nepalese context before including these in the PAL-Nepal guidelines. They identified several barriers related to drug treatment and human resources, although these have not been addressed systematically. The adaptation process can benefit from using checklists for barriers and facilitators as used, for example, by Flottorp and Oxman (2003). These tools can also be integrated in the generic PAL package, as is the case in the adaptation of PAL in South Africa.

### The social system: stakeholder analysis at national level

The assessment of stakeholders at national level has been informative in that it has shown the real status of the policy process: as long as PAL-Nepal is dealt with as a pilot implementation project of the WHO and the Ministry of Health – and by other potential future stakeholders – it will not mobilize opposition or support from others. At this stage, the receptiveness for PAL-Nepal was high. Respondents added that if PAL-Nepal is to be implemented nationwide, less tolerant stakeholders might be identified due to the financial implications. So far, the financial input has been relatively low and also has been covered by an international donor. The respondents commented that positive results from

the effect evaluation were necessary to mobilize political will and more financial resources. These critical factors have not yet been addressed explicitly.

### The social system at district and local levels

During the development of PAL-Nepal, several aspects of the social and organizational context at district and local levels were identified that potentially obstruct its effective implementation. Some were addressed effectively (inapplicable treatments), others were only temporarily solved (staff transfers) or not at all (drug availability, absenteeism of PAL-trained staff in sub-health posts). In the literature, other obstructing factors are reported. General factors affecting health service delivery in Nepal are poor human resources, difficult geography and poor general infrastructure (Bentley 1995; Bishai et al. 2002; Osrin et al. 2003; Pokhrel and Sauerborn 2004). Others address factors that more specifically influence the district and local services' ability to take central guidance. Campbell et al. (2003) mention a lack of human and financial resources and motivation. These two factors hamper the utilization of clinical protocols and operational guidelines, although these tools are considered to be important and widespread in Nepal (Campbell et al. 2003). In addition, high absenteeism and communication gaps between villagers and rural health workers, on the one hand, and the higher health authorities, on the other, play an important role (Justice 1983, 1984, 1986).

Aitken (1994) presents an explanatory model for the functioning of district health services that shows 'two value systems or theories with entirely different aims and expectations... Officially, the organization's value system emphasizes the services delivered: their quality and the number delivered.' The implicit theory is:

> *'that the organization exists in order to distribute and account for funds and to provide the staff... with income. The duty of staff is therefore the provision of reports showing how these funds have been distributed and justifying their expenditure in terms of ''showing progress'' towards government targets... The actual services provided are not seen to be very important. The staff are aware of both theories, often translating the demands of one into the language of the other.' (Aitken 1994)*

It is crucial to understand these local circumstances in which changes are meant to take place.

Our observations and experiences confirm the comments made by Campbell, Justice and Aitken. We observed a multitude of separate activities in the district capital to support and improve the quality of health services, sponsored by national and international organizations, including the PAL-activities. These activities generated needed additional staff income, i.e. daily allowances and travel allowances. Also, they gave health workers a welcome change from work in remote stations and an opportunity to meet up with colleagues. This resulted in significant absenteeism of health workers from clinical work. Additional earnings through drug retail or private practice were the rule rather than the exception. Drugs that were not available at government facilities could often be purchased from the private businesses of health workers. Health workers spent their working hours combining private and public jobs, favouring the more profitable private jobs, while making sure that reports were presented on time. The centrally run staff appointment system also contributed to absenteeism, as health workers were appointed to unfamiliar localities. Health workers could spend a lot of time in administrative offices negotiating transfers to a more suitable location. Health workers and senior supervisors reported that supervision of peripheral staff in their own duty stations was rare. Supervising tasks had to compete with providing clinical health services at district level, facilitating training courses and workshops, and travelling to regional and national administrative offices. Although the current mechanism for introduction of PAL-Nepal seems appropriate in this stage of PAL development (i.e. through the additional financial incentives provided by a donor in a small pilot), we anticipate that in future, alternatives may be required linking implementation to adaptation of existing systems, for example through the integration of PAL-guidelines into existing training curricula.

We observed that despite these difficult circumstances, health staff were very positive and willing to contribute to the implementation of PAL-Nepal, for example, by facilitating meetings or participating in content discussions. PAL-Nepal is endorsed by the Department of Health Services and facilitated and promoted by the National Tuberculosis Centre, which established operational success through charismatic leadership, staff motivation and strong communication lines (Hamlet and Baral 2002). This programme setting ensured attention and cooperation from the health workers.

## Conclusion

Our ex-ante assessment of the adaptive local implementation of international WHO guidelines showed that the feasibility to implement PAL-Nepal could be improved, given the characteristics of the guideline package, the implementation strategy and the social system (in July 2002). The innovation has potential for improvement, the implementation strategy is limited and the social system has several cultural and manpower problems at district and local levels. Besides the technical and organizational challenges posed by the assessment of the innovation and the implementation strategy, we argue that the social and organizational reality of the district health services in Nepal needs a more prominent role in the efforts to change clinical practice. Borrowing the approach – and the reputation as well – from the successful tuberculosis control programme might prove to be an important step. It can be explored further whether its organizational structure (including reporting, supervision and public relations) can be copied to the PAL-Nepal network of involved primary care health workers in rural Nepal.

We emphasize that both the context-specific PAL-Nepal and the global, generic PAL package are in the development stage. Our findings contribute to the maturation of the PAL programme, as do the findings from colleagues who evaluate PAL elsewhere in the world.

This paper is one in a series of assessment reports supporting PAL's further implementation. Developing good generic innovative interventions globally is just the first step in a long process towards successful implementation in local, specific contexts. Assessment of the feasibility of implementation can contribute to efficient allocation of scarce resources. The selected instruments allow for specific recommendations for further development of both the generic as well as the adapted guideline package in Nepal. In order to successfully transfer global knowledge into local practice, we need to support the development of additional sustained interventions that tackle other, culture- and health system-specific barriers as well. Health workers are key informants for these barriers.

## Endnote

[1] The Practical Approach to Lung Health (PAL) was initially titled Adult Lung Health Initiative. The name was changed in 2001.

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