

# Practical Approach to Lung Health (PAL)

A primary health care strategy  
for the integrated management of respiratory  
conditions in people  
five years of age and over

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# PRACTICAL APPROACH TO LUNG HEALTH (PAL)

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## **1. Introduction**

The objectives of the DOTS strategy to control tuberculosis (TB), as adopted by the World Health Assembly and endorsed by the Stop TB Partnership, are to cure at least 85% of the sputum smear-positive TB cases put on anti-TB treatment and to detect at least 70% of the estimated new sputum smear-positive TB cases worldwide. These objectives are a prerequisite to halve TB prevalence and deaths from TB in order to halt and begin to reverse the incidence of TB by 2015, as formulated in the United Nations Millennium Development Goals.

Since the inception of the DOTS strategy, the cure rate among TB patients put on treatment has increased significantly in many countries. In 2002, this rate reached 82% in those areas where DOTS had been implemented. However, the global average detection rate remains well below the established target of 70%; indeed, in 2003 only 45% of all estimated smear-positive TB cases were identified under DOTS conditions.

In the light of this, the World Health Organization (WHO) is currently considering a variety of strategies to improve TB case detection – while maintaining the gains achieved in treatment outcomes – through the development and implementation of a multifaceted approach. This approach includes:

- Global DOTS Expansion, which aims to accelerate DOTS coverage for populations living in areas where DOTS has not been yet implemented, with a particular focus on the 22 countries where the burden of TB is high;
- the Public-Private Mix approach, which aims to link all health-care providers – public and private – to national TB control programmes (NTPs). The purpose is to extend quality TB care to all patients managed outside national NTPs;
- the Interim Policy on Collaborative TB/HIV Activities, which aims to develop collaboration between TB control and HIV/AIDS programmes in order to improve the prevention, identification and management of TB among people living with HIV/AIDS as well as the prevention, identification and management

of HIV among TB patients, particularly in country settings where the burden of HIV is high;

- the Community-Based DOTS approach, which aims to involve communities in TB control activities, with a particular focus on those regions where access to health-care services is poor; it also focuses on improving quality of care for TB patients within their communities;
- the Practical Approach to Lung Health (PAL), which aims to improve TB diagnosis and care by improving: (i) the quality of respiratory care in primary health care (PHC) settings, and (ii) the efficiency of respiratory service delivery within health systems.

## **2. Burden of respiratory illnesses**

Respiratory diseases are responsible for a considerable burden of suffering and death in all age groups worldwide. Although respiratory diseases have always been an important cause of morbidity and mortality, in recent decades, their incidence has steadily increased everywhere. This rise can be attributed to a rapid increase in a number of risk factors such as tobacco smoking habits in developing countries, the HIV epidemic, urbanization, industrialization, atmospheric pollution, and the deterioration of socioeconomic conditions in certain countries.

In 2002, respiratory conditions were responsible for more than 11 million deaths worldwide; this translates as a specific mortality rate equal to 183 per 100 000 population and a proportionate mortality rate of 20% (Table 1).

The most frequently occurring respiratory diseases that result in significant morbidity and mortality are pneumonia and other acute respiratory infections (ARI), TB, asthma, chronic obstructive pulmonary disease (COPD) and lung cancer. TB and pneumonia are important causes of morbidity and mortality in young adults in low- and middle-income countries, while pneumonia and lung cancer have a significant incidence and are an

important cause of mortality in persons over 50 years of age in high-income countries. The burden of asthma has increased worldwide both in adults and children; it has shown a particularly marked increase in children in developing countries over the past five years. COPD is a frequent cause of disability and death everywhere.

Respiratory conditions account for up to one third or more of the demand for health care by patients aged five years and over in PHC settings (Figure 1). Of these conditions, approximately 80% tend to be identified as ARIs and 1% to 2% as TB. In PHC settings, clinical symptoms presented by pulmonary TB patients are, in general, similar to those symptoms displayed by non-tuberculous respiratory patients, particularly those with persistent symptoms. The aim of PAL, therefore, is to develop and implement a strategy for a comprehensive, systematic and symptom-based approach to manage patients who seek care for respiratory symptoms in PHC settings. This approach should lead, on the one hand, to an improvement in the identification and management of TB with respect to the other respiratory affections, and on the other hand, to an improvement in the identification and management of non-tuberculous respiratory conditions with respect to TB.

### **3. Objectives of PAL**

PAL is a primary health care strategy for the integrated management of respiratory conditions in patients aged five years and over in developing countries. It is a syndromic approach, with a major emphasis on TB, ARIs, including pneumonia, and chronic respiratory diseases (CRD), namely asthma and COPD. With the exception of TB in those areas where DOTS has been implemented, case management of respiratory illnesses in people aged five years and over is most often inadequate. There are three principal explanations for this: (i) the quality of diagnosis of respiratory diseases tends to be poor, contributing to increasing the number of false smear-negative TB cases, (ii) there are no clear criteria for the referral of respiratory patients to upper level health facilities, and (iii) treatment prescriptions are non-standardized and often inappropriate.

The PAL strategy has four major groups of objectives:

### **3.1 Epidemiological objectives**

These concentrate on reducing the morbidity and mortality burden of respiratory diseases through: (i) a reduction in TB morbidity, mortality and risk of transmission of TB infection (ii) a decrease in case fatality from pneumonia, particularly in settings with a high prevalence of HIV (iii) the prevention of complications from bacterial upper respiratory infections such as streptococcal pharyngitis, otitis media and sinusitis and (iv) a reduction in the number of episodes of asthma attacks and COPD exacerbation as well as a reduction in severe forms of asthma.

### **3.2 Quality care objectives**

These focus on improving the clinical management of respiratory cases in general. More specifically, the PAL strategy aims to: (i) improve the identification of TB suspects among respiratory patients (ii) improve the quality of TB diagnosis among TB suspects, especially for those in whom sputum smear microscopy tests reveal a negative outcome, and particularly in HIV-positive patients (iii) strengthen the quality of care for TB patients (iv) contribute to ensuring a high rate of success in the treatment of TB (v) standardize the management of ARIs, in particular pneumonia (vi) improve the management of respiratory infections in HIV-positive patients, (vii) standardize the management of asthma and COPD (viii) upgrade the appropriate management of asthma attacks and COPD exacerbations within the district health system (ix) organize the long-term management of patients with CRDs within the district health system, and (x) monitor in a systematic way the prolonged basic treatment of patients with CRDs and assess its impact on their quality of life, particularly in asthma and COPD patients.

### **3.3 Managerial objectives**

These aim to increase the efficiency of activities for the planning and implementation of PAL. To this end PAL: (i) standardizes drug treatment of respiratory diseases (ii) promotes countries' essential drug lists (iii) helps define and formulate criteria for

requesting laboratory tests, chest radiography and other complementary tests (iv) establishes clear criteria, on the one hand, for the referral of cases to an upper level facility for hospitalization or further assessment and, on the other hand, for counter-referral to a lower level facility for management and/or follow-up (v) defines the role of each category of health worker in the management of respiratory cases according to health care level (vi) identifies and formulates the essential equipment needed for the diagnosis and treatment of respiratory conditions in first level health facilities and upper level facilities, such as district hospitals (vii) helps define parameters to be used for planning at the district level and contributes to rationalizing the management of the resources available in the district health system, (viii) defines indicators to monitor and evaluate the impact and performance of health service delivery and (ix) uses as much as possible the existing health management information system (HMIS) and TB control information system in order to collect the essential data needed to measure the key indicators.

### **3.4 Cost-effectiveness objectives**

These focus on reducing the cost of management procedures and promoting cost-effective health care interventions for respiratory conditions through: (i) a reduction of the managerial costs per respiratory patient (ii) a reduction in the total cost of asthma management, including direct and intangible costs (iii) a reduction in the level of absenteeism and disability associated with asthma and COPD (iv) a reduction in the number of visits to emergency rooms and intensive care units by patients with CRD, particularly asthma and COPD (v) an increase in the number of respiratory patients managed in PHC settings and (vi) a reduction in the level of hospital morbidity associated with respiratory illnesses.

## **4. PAL adaptation**

In order to facilitate the development of PAL, the PAL strategy needs to be adapted not only to the epidemiological and socioeconomic specificities of countries, but also to

their existing health policies. Great differences exist among countries in the resources available at first level health facilities as well as at referral levels. These differences can be attributed to: (i) variations in categories of health care levels, (ii) differing levels of education and training among health care staff, (iii) access to laboratory facilities, (iv) availability of equipment, whether basic (e.g. functioning weighing scales, thermometers) or diagnostic (e.g. stethoscope, sphygmomanometer, peak flow meter, spirometer, X-ray) or therapeutic (nebulizers, sources of oxygen), (v) access to and affordability of essential drugs as formulated by WHO, and (vii) coverage of the district health system by the HMIS and TB control information system.

In addition, national health priorities are likely to differ among countries depending on the level of epidemiological transition and the burden of HIV infection in the population. Table 2 indicates how the distribution of the burden of respiratory conditions varies according to the socioeconomic status of countries and HIV burden. Indeed, in low-income countries and in settings with a high prevalence of HIV, the control of tuberculosis and acute respiratory infections is likely to take preference over the need to improve case management for CRDs. In contrast, in middle- and high-income countries, CRDs are likely to be considered important health priorities.

## **5. Standardization of clinical care**

Whatever the resources available, the great majority of patients with respiratory symptoms can be appropriately managed at the district level, either within first level health facilities or at the first referral level.

One way of ensuring this is through the establishment of clinical practice guidelines. Clinical practice guidelines can be used to achieve the standardization and integration of case management for priority respiratory illnesses at each level of the district health system. These guidelines need to be adapted to the health environment of the country.

This adaptation process should result in model guidelines specifically tailored to the country.

Experience in different countries has shown that the development of case management guidelines for first level health facilities should be based on key principles. Indeed, guidelines should include instructions about the minimum number of relevant symptoms and signs that must be utilized in order to establish diagnostic classification, and assess the degree of severity of respiratory conditions encountered in PHC settings. Ultimately, the guidelines should help PHC workers to make appropriate decisions. In general, there are five alternatives: (i) severely ill patients must be referred to an upper level for urgent management and/or hospitalization, (ii) non-severe exacerbations of respiratory conditions, such as a wheezing episode, should be immediately treated at the PHC unit and, depending on the response, the patient should either be referred to hospital for further management or treated at home, (iii) respiratory patients, such as CRD cases, who require additional tests or assessment by a specialist should be referred to an upper level health facility, (iv) non-severe cases of bacterial upper respiratory infections, pneumonia, asthma and COPD need to be treated at home on an outpatient basis using specific drugs such as antibiotics, bronchodilators or corticosteroids, and (v) non-bacterial ARIs need home treatment with symptomatic medications only, not antibiotics.

Whatever the model, PAL guidelines should be in line with: (i) the rules governing drug prescription, particularly antibiotic prescribing, (ii) the international recommendations for the management of lower ARIs and pneumonia, (iii) the DOTS strategy, and (iv) the management of asthma and COPD as respectively defined by the Global Initiative for Asthma and the Global Initiative for Chronic Obstructive Lung Disease.

Furthermore, in country settings, the development of PAL guidelines should be in line with existing national guidelines such as the NTP guidelines, HIV/AIDS guidelines, the integrated management of adolescent and adult illness (IMAAI) guidelines, or other existing and relevant clinical guidelines.

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Only drugs that feature on WHO's Essential Drug List are recommended by the PAL guidelines. As much as possible, special care should be taken to include the cheapest option when several equally effective alternatives exist. However, the availability and cost of some of the drugs required to maximize respiratory health outcomes, in particular those needed for CRDs, remain an issue of concern. Medications for inhalation, such as inhaled corticosteroid and ipratropium bromide, are still not available or are financially prohibitive for the majority of asthmatic and COPD patients in many developing countries. The International Union Against Tuberculosis and Lung Disease has developed guidelines for the management of asthma in low-income country settings; these guidelines recommend using the cheapest cost-effective drugs.

Respiratory cases referred from first level health facilities to the upper health care level also need to be managed in standardized ways through the adaptation and development of appropriate clinical guidelines. In contrast to symptom-based guidelines for first level health facilities, PAL guidelines for level of referral need to be more disease-based. Furthermore, these guidelines should be formatted according to the manner in which health care services are institutionally provided, for instance: emergency and outpatient care, inpatient care, discharge, follow-up, counter-referral and special care.

Clinical encounters in PHC facilities are not only seen as curative, but also as opportunities for disease prevention and health promotion. Health education is important to ensure long-term treatment adherence and promote safe behaviour. Health education should aim to: (i) ensure that TB patients cooperate with directly supervised treatment and the process of examination of TB contacts, (ii) ensure that asthma and COPD patients stick to self-medication regimes and learn how to adequately perform inhalation procedures and when to seek care, (iii) help asthma patients to avoid asthma attack-triggering factors, (iv) advise all respiratory patients who smoke to quit smoking, and (v) promote prevention of tobacco use among respiratory patients in PHC settings.

## **6. Coordination**

In a well-established PHC system, coordination within the health sector requires organized collaboration among health workers at the same and different levels of the health system, as well as within and among the various categories of health workers. This helps ensure the most efficient use of available health resources. To be successful, coordination also requires that the involvement, in respiratory case management, of each category of health-care provider and each level of health care be clearly defined.

While PAL guidelines define and standardize the management of respiratory conditions, full integration of case management, within the district health system, requires coordination between first level health facilities – such as health centres – and referral facilities – such as small district hospitals.

Moreover, the development and implementation of the PAL strategy also requires coordination with: (i) the national health resource planning authorities in order to identify the resources needed for PAL development and implementation in the process of national planning, (ii) the TB control programme, (iii) the HIV/AIDS programme, (iv) the IMAAI project, (v) PHC services and the management of general health services for training, supervision, logistics, and communication, (vi) HMIS for monitoring and evaluation of PAL activities, (vii) the Essential Drugs Programme in order to make drugs available and affordable for respiratory patients, and (viii) any programme associated with health reform in country.

The experience gained from applying the TB monitoring and evaluation system, forms the basis for devising a set of instruments through which such coordination can be achieved. In addition to clinical coordination between first and referral health care levels, the PAL strategy, with its standard information tools based on the existing HMIS, also aims to link individual standardized case registration with supervision, monitoring and evaluation. The information system facilitates routine disease registration, and coordination of activities between single purpose programmes, such as

the NTP, the HIV/AIDS programme, and general health services, usually coordinated by the department of primary health care.

## **7. PAL perspectives**

PAL represents a natural evolution in TB control activities towards the standardization of case management of respiratory conditions. PAL should be envisaged in areas where the DOTS strategy has been effectively implemented, PHC structures are available and there is a formal political commitment to adapt, develop and implement this approach.

Millions of patients suffer from respiratory diseases because of poor access to appropriate diagnosis and treatment. Many episodes of respiratory conditions are treatable with effective and affordable medications. PAL aims to reinforce TB control, improve access to appropriate care for all respiratory patients in PHC settings, contribute to promoting respiratory health, and strengthen management within district health systems.

### **7.1 PAL strategy and TB control**

By improving the management of respiratory illnesses in general at PHC level, and by establishing a method for the systematic monitoring and follow-up of CRDs, PAL is likely to encourage an increasing number of respiratory patients to attend PHC facilities. This will, therefore, contribute to a greater identification of TB cases among patients with respiratory symptoms. By defining and standardizing the management of non-tuberculous pulmonary conditions, PAL should, under normal circumstances, improve the quality of pulmonary TB diagnosis by reducing the number of false pulmonary TB cases, particularly false smear-negative TB cases. The PAL strategy is likely to facilitate the integration of TB control activities within PHC services, particularly in countries where TB control programmes are highly vertical. Given the major focus of PAL on TB, its development and implementation should logically keep this disease high among health priorities in country settings where there are ongoing health sector reforms, as

well as keep TB control on the agenda in settings in epidemiological transition, particularly where the burden of TB has begun to decrease.

## **7.2 PAL strategy and respiratory care services**

PAL provides an essential and integrated health care package to address the challenging burden of respiratory illnesses in PHC settings. Moreover, at this level, it is likely to facilitate the management of HIV patients in whom respiratory symptoms account for one of the most frequent causes of demand for care. PAL contributes to strengthening the minimum package of health activities for populations at the district level.

## **7.3 PAL strategy and district health systems**

PAL is likely to facilitate health resource planning within the district health system, since standard case management should clearly define the training needs, equipment, drugs and other supplies required in first level health facilities and at the referral level. PAL is also likely to help district health authorities to cope with decentralization and health sector reform.

Data from countries clearly indicate that PAL is likely to improve drug prescription while decreasing its cost (Table 3). PAL upgrades the skills of PHC workers. By strengthening PHC services and increasing their capacity to meet the needs of patients, the PAL strategy will increase their utilization by patients seeking care for respiratory symptoms, particularly in settings with a high prevalence of HIV. It can, therefore, contribute to reinforcing the confidence of the population in PHC services. Given the various components of PAL, it should help to strengthen links between the technical and managerial tasks at the different levels of the district health system.

## **8. Conclusion**

PAL is an integrated strategy to manage respiratory patients in PHC settings with a focus on priority respiratory diseases, particularly TB, ARIs, including pneumonia, and CRDs, namely asthma and COPD. Its objectives are to improve the quality of respiratory case management and the efficiency of the health system to deal with respiratory conditions. PAL should be adapted to the health environment of country settings. It relies on two pillars: (i) standardization of the management of respiratory conditions, and (ii) coordination among the relevant bodies dealing with respiratory care services within the district health system.

Further issues need to be addressed in order to fully promote PAL. These include: (i) price reduction schemes to increase access to drugs for chronic respiratory illnesses should be set in motion for developing countries, (ii) standards for reliable, affordable, low-technology, least consumable-dependent diagnostic equipment should be defined and developed, and (iii) even though PAL focuses on health care services within the district health system, support for clinical interventions should be extended beyond the health facilities to the community level, through the development of public health campaigns to promote respiratory health.

Table 1. **Mortality from respiratory diseases,\* all ages, by country mortality stratum (estimates for 2002)**

Mortality Stratum		Population (in thousands)	Total deaths number (in thousands) and rate per 1000	Deaths from respiratory diseases number (in thousands) and rate per 100 000	Respiratory deaths among all deaths (in %)
A.	Very low child Very low adult	904 303	7 786 8.6	1 285 142.1	16.5
B.	Low child Low adult	2 670 905	18 257 6.8	3 834 143.5	21,0
C.	Low child High adult	239 717	3 779 15.8	306 127.6	8.1
D.	High child High adult	2 037 977	21 110 10.4	4 876 239.2	23.1
E.	High child Very high adult High HIV prevalence	360 965	6 007 16.6	1 071 296.7	17.8
TOTAL		6 213 167	56 939 9.2	11 372 183.0	20.0

\*: Deaths from respiratory diseases related to HIV infection are excluded.

A: includes 3 countries from Americas, 26 from Europe and 5 from Western Pacific Region;

B: includes 26 countries from Americas, 13 from Eastern Mediterranean Region, 16 from Europe, 3 from South-East Asia, and 22 from Western Pacific Region;

C: includes 9 countries from Europe;

D: includes 25 countries from sub-Saharan Africa Region, 6 from Americas, 9 from Eastern Mediterranean Region and 7 from South-East Asia;

E: includes 20 countries from sub-Saharan Africa Region.

Figure 1. Proportion of patients, aged five years and over, with respiratory symptoms in primary health care facilities with medical officers

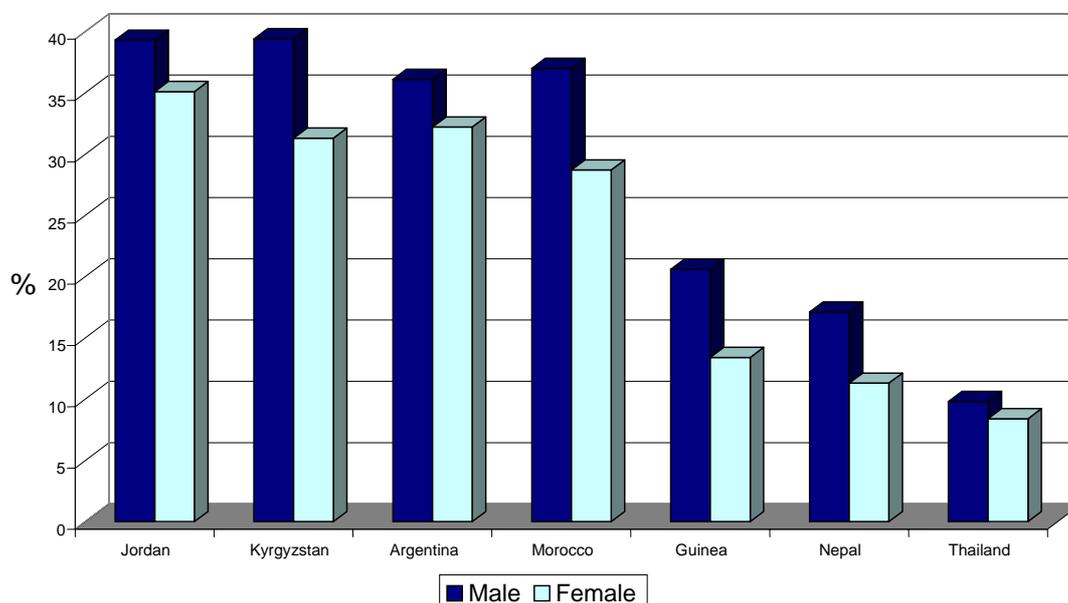


Table 2. Distribution, in percentage of DALYs, of respiratory diseases' burden in the population aged 15 years and over, by epidemiological profile and socioeconomic status of countries, 2000\*

Respiratory conditions	High-HIV prevalence countries	Low-income countries	Middle-income countries	High-income countries
Acute respiratory diseases	70.8%	59.4%	32.4%	12.8%
Chronic respiratory diseases	16.0%	30.6%	58.0%	73.5%
Other respiratory diseases	13.2%	10.0%	9.6%	13.7%
<b>OVERALL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

\*: Arranged from:  
[http://www3.who.int/whosis/menu.cfm?path=evidence,burden,burden\\_estimates,burden\\_estimates\\_2000,burden\\_estimates\\_2000\\_V3,burden\\_estimates\\_2000\\_V3\\_Subregion&language=english](http://www3.who.int/whosis/menu.cfm?path=evidence,burden,burden_estimates,burden_estimates_2000,burden_estimates_2000_V3,burden_estimates_2000_V3_Subregion&language=english)

Table 3. **Impact of the Practical Approach to Lung Health (PAL) on drug prescription in Kyrgyzstan and Morocco**

Indicators	Kyrgyzstan, 2003			Morocco, 2002		
	Before PAL (1)	After PAL (2)	Variation % (1) - (2) ----- (1)	Before PAL (1)	After PAL (2)	Variation % (1) - (2) ----- (1)
Sample size: number of respiratory patients	893	992		1520	3352	
Any drug prescription: % of patients	95.2	97.7	+ 2.6**	93.8	90.9	- 3.1*
Number of drugs per prescription	2.6	2.3	- 11.3*	2.0	1.7	- 15.0*
Antibiotics prescribed: % of patients	57.5	44.1	- 23.3*	71.7	53.7	- 25.1*
Average cost of drug prescription per respiratory patient	Coms 148.6	Coms 100.6	- 32.4*	Dirhams 72.0	Dirhams 59.0	- 18.1*

\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ;

Dirhams and Coms are the national currencies of Morocco and Kyrgyzstan;

In both countries, the management of respiratory patients by medical officers in PHC settings was assessed according to a standard study protocol. This assessment was carried out before and after the implementation of PAL guidelines and involved the same medical officers.