



WORLD HEALTH ORGANIZATION  
STOP TB DEPARTMENT  
20, AVENUE APPIA  
GENEVA 27, SWITZERLAND



INTERNATIONAL LABOUR ORGANIZATION  
ILO PUBLICATIONS  
4, ROUTE DES MORILLONS  
GENEVA 22, SWITZERLAND

ISBN 92 4 154604 2



# GUIDELINES *for* WORKPLACE TB CONTROL ACTIVITIES

## THE CONTRIBUTION OF WORKPLACE TB CONTROL ACTIVITIES TO TB CONTROL IN THE COMMUNITY



WORLD HEALTH ORGANIZATION



INTERNATIONAL LABOUR ORGANIZATION

# **Guidelines for workplace TB control activities**

## **The contribution of workplace TB control activities to TB control in the community**

by

Dermot Maher, World Health Organization, Geneva, Switzerland

Francesca Boldrini, Global Health Initiative, World Economic Forum, Geneva, Switzerland

Vikram Pathania, University of California, Berkeley, CA, USA

Benjamin O Alli, International Labour Organization, Geneva, Switzerland

with

Phyllis Gabriel, Sophie Kisting, Pierre-Yves Norval,



**World Health Organization  
Geneva**



**International Labour Organization  
Geneva**

WHO Library Cataloguing-in-Publication Data

Guidelines for workplace TB control activities: the contribution of workplace TB control activities to TB control in the community / writing team : Benjamin O Alli [et al.].

1.Tuberculosis, Pulmonary — prevention and control 2.Tuberculosis, Pulmonary — drug therapy 3.Tuberculosis, Multidrug-resistant 4.Workplace 5.Occupational health services — organization and administration 6.Guidelines I.O Alli, Benjamin.

ISBN 92 4 154604 2 - (NLM classification: WF 405) - WHO/CDS/TB/2003.323

© World Health Organization 2003

All rights reserved.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The authors alone are responsible for the views expressed in this publication.

---

Further information is available at:

CDS Information Resource Centre,  
World Health Organization  
1211 Geneva 27, Switzerland  
Fax: +(41) 22 791 4285  
E-mail: [cdsdocs@who.int](mailto:cdsdocs@who.int)

## Contents

Preface		5
Acknowledgements		6
Foreword		7
Endorsement		8
List of abbreviations		9
Glossary		10
<b>Chapter 1.</b>	<b>Introduction</b>	13
1.1	Background	13
1.2	Structure and use of the guidelines	14
1.3	Impact of TB on business	15
1.4	Main stakeholders in workplace TB control activities	16
1.5	Opportunities for workplace TB control activities	18
1.6	Occupational risk of TB	21
1.7	Coordination with NTP	21
1.8	Ensuring sustainability of TB control activities	21
<b>Chapter 2.</b>	<b>Background information on TB</b>	25
2.1	TB and how it spreads	25
2.2	The DOTS strategy for TB control	26
2.3	TB and HIV	27
2.4	Multidrug-resistant TB	27
<b>Chapter 3.</b>	<b>TB control in the workplace: opportunities, principles, and examples</b>	29
3.1	Why the workplace offers good opportunities for TB control activities	29
3.2	Guiding principles for implementing TB control activities at the workplace	29
3.3	Gain senior management commitment to ensure successful TB control activities	32
3.4	Case study of small employers' contribution to TB control activities	33
3.5	Case studies of workplace DOTS programmes implemented by large employers	33

## 4

<b>Chapter 4.</b>	<b>How to implement TB control activities in the workplace</b>	37
4.1	Detecting TB cases in the workplace	37
4.2	Treatment of TB patients	40
4.3	Promoting adherence to treatment	42
4.4	Common drug side-effects	44
4.5	Drug supply	44
4.6	Recording patients and reporting treatment results	44
4.7	Special considerations	46
<b>Chapter 5.</b>	<b>Policy development and financing</b>	53
5.1	Establishing a TB policy for the workplace	53
5.2	Legal framework for workplace policies	55
5.3	Agreements with contractors and associated companies	55
5.4	Role of worker representatives and organizations	56
5.5	Using external resources to improve the quality of TB control activities	56
5.6	Employer TB programmes under franchise or accreditation schemes	57
5.7	Sources of technical guidance and funding support	58
<b>Chapter 6.</b>	<b>TB activities in the workplace and the community</b>	59
6.1	Extending services to employees' dependants	59
6.2	Extending services to the wider community	60
6.3	Education and training	62
6.4	Promoting World TB Day activities	63
<b>Annexes</b>		
1.	Sample tools to help implement DOTS in the workplace	65
2.	Additional resources available on request	71

## Preface

The World Health Organization (WHO) and the International Labour Organization (ILO) have joined forces to produce these guidelines with the goal of harnessing the contribution of employers and workers towards the control of tuberculosis (TB). TB is one of the world's leading causes of illness and death due to an infectious disease. Every year, there are 8 million new cases of TB and – even though the disease is curable – 2 million deaths, i.e. some 5000 deaths each day. Three-quarters of these TB deaths and cases occur in people aged between 15 and 54 years, the most economically productive age group. TB is a problem not only for individuals but also for communities. Each person who develops the most infectious form of the disease will infect about another 20 people in his or her lifetime. Transmission of TB infection results in the huge global burden of TB cases and deaths, and has significant economic consequences for individuals, families, communities, employers, and countries.

Employees with TB often lose a considerable amount of working time: effective treatment means they can often quickly return to productive employment. With a course of treatment costing as little as US\$ 10 per patient, the World Bank has ranked TB treatment as one of the most cost-effective of all health interventions.

Until recently, many national TB programmes (NTPs) have relied mostly on government health services for the provision of TB care (diagnosis and treatment). However, to make effective TB care available to all who need it, NTPs need to work with all general health care providers and stakeholders – including government health facilities, nongovernmental organizations (NGOs), private practitioners, religious organizations, community groups, and employers. There is increasing recognition of the need to harness the contribution of employers and of the potential gains for businesses. The business sector has the expertise and management skills needed to successfully implement or augment TB control activities. Where there is a specific occupational health risk of TB, employers have a particular responsibility for implementing specific TB control measures in the workplace. Workplace TB control offers both the employer and the community real benefits.

These guidelines represent the first comprehensive approach to workplace TB control. They draw on the practical experience of employers and workers and the technical expertise of WHO and ILO. They cover all the practical steps involved in establishing TB control activities, including (for large employers) starting and running a workplace TB control programme. They are intended for use in all countries in which TB incidence is high; these will be mainly the low- and middle-income countries that carry 95% of the global TB burden. The target audience for the guidelines includes employers, employee organizations, NTP managers, and agencies providing technical support for TB control.

Employers and employees have much to contribute to TB control as part of the global movement to Stop TB. Comments on the guidelines are welcome and will help to improve future editions; they should be sent to the WHO Stop TB Department. Revision of the guidelines in future will reflect further experience gained in workplace TB control activities.

## **Acknowledgements**

The writing team and consensus group were coordinated by Deboh Akin-Akintunde (WHO) and Sarah England (WHO), in collaboration with Kate Taylor (World Economic Forum).

The consensus group consisted of the following who reviewed the guidelines:

Dongil Ahn, N. Barua, Henk Bekedam, Leopold Blanc, Richard Bumgarner, Patrizia Carlevaro, Daniel Chin, Gavin Churchyard, Pierpaolo de Colombani, Lucica Ditiu, Bernard Dizier, Gerry Eijkemans, Marcos Espinal, Marilyn Fingerhut, Tony Gama, Ria Grant, Penny Grewal, Petra Heitkamp, Jacob Kumaresan, G.R. Khatri, Susan Leather, Miranda Milma, Tennessee Maritza, Jai Narain, Shengli Niu, Salah Ottmani, Emanuele Pontali, Mario Raviglione, Nina Schwalbe, Akihiro Seita, Teresa Seitz, Ian Smith, Sonia Smith, Mukund Uplekar, Gregory Wagner, David Weisman.

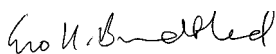
## Foreword

*Many partners have crucial roles to play in the global movement to Stop TB. The national TB programme is responsible in each country for the stewardship of TB control activities. This involves coordinating the activities of a wide range of health service providers in contributing to TB control. TB is a workplace issue because health is essential not only to the well being of individuals but the functioning of economies. Poor health among working people is a threat to the viability of enterprises and the national stock of human capital. The productivity of the workplace, in particular, is weakened by the loss of skills and experience, absenteeism, disrupted production, and escalating direct costs.*

*For this reason employers' and workers' organizations are key collaborative partners for TB control activities with the NTP. Employers can play a vital role in promoting and undertaking TB control activities in the workplace and in the neighbouring community. Workers' organizations can collaborate in these activities and advocate for the needs of employees, including health care. For private and parastatal business, and for the public sector, TB control represents a win-win situation. Employers benefit from investment in a healthier workforce and the demonstration of corporate social responsibility. The community in general stands to benefit from improved TB control resulting from the contribution of workplace TB control to overall TB programme activities in a particular country.*

*There are two facets to workplace TB control activities. Firstly, the workplace represents an opportunity for making TB control convenient and accessible to infected workers. Secondly, workers have the right to operate in an environment that does not pose undue hazards to health, and employers have the responsibility to implement measures that decrease the occupational risk of TB. These measures comprise environmental controls and the steps to identify and ensure the treatment of employees with TB and therefore to stop the cycle of TB transmission.*

*All employers, in collaboration with employee representatives and workers' organizations, can play a role in contributing to TB control. These guidelines outline the different TB control activities relevant to different employers. We hope that all of the key partners involved in workplace TB control activities will use these guidelines in making their contribution to the global movement to Stop TB.*



Dr G.H. Brundtland  
Director-General  
World Health Organization



J. Somavia  
Director-General  
International Labour Organization



## Endorsement

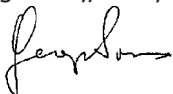
*My involvement with the Stop TB partnership began three years ago when I commissioned the development of a comprehensive business plan for the activities and resources urgently needed to control the spread of TB. The result was the Global Plan to Stop TB, a collaboration of over 200 experts in the TB community who have detailed a clear line of action and a novel approach to containing the epidemic. Two years since its launch, the Plan is closer to reaching its goals, introducing new information and programmes and expanding the network of those committed to controlling TB.*

*Guidelines for workplace TB control activities will play a key role in this effort. These guidelines are not only the first framework created for TB management in the workplace, but also proof that public-private partnerships between the TB community and the business sector are critical to achieving the goals set by the Global Plan. The Guidelines for workplace TB Control activities offer businesses a practical model to control TB in the workplace as well as an invitation to contribute their capacities, skills, and resources to complementary public sector activities.*

*As a philanthropist, I believe that corporations can be powerful advocates for health. By implementing TB programmes in the workplace, corporations can take a first step toward advocacy and engaging with the community as part of a broader corporate responsibility agenda.*

*As a businessman, I believe that implementation of the Guidelines is one of the best investments companies can make. Tuberculosis is one of the world's most treatable and curable infectious diseases yet it has become a humanitarian disaster that affects all levels of society, killing two million people each year – 75% of whom are in their prime working years. TB hampers economic development by reducing workforces, diminishing productivity, and cutting household incomes by a third. Interrupted or improper treatment of the disease can lead to drug resistance, requiring regimens 100–1400 times more expensive than DOTS, the internationally recommended and most cost-effective strategy for TB control. As TB is the leading killer of people living with HIV/AIDS, sound TB control programmes are especially crucial in countries with high HIV prevalence. Left unchecked, TB can have devastating effects on businesses and communities. The private and public sectors must work together to find and implement creative solutions to this deadly epidemic.*

*I strongly urge business leaders to consider these guidelines as a practical means to assess their companies' risks and opportunities, and as an invitation to join the global effort to prevent the needless economic and human destruction caused by TB.*



George Soros  
Chairman, Open Society Institute

## List of abbreviations

AFB	acid-fast bacilli
AIDS	acquired immunodeficiency syndrome
CDC	Centers for Disease Control and Prevention
DOT	directly observed treatment
DOTS	the internationally recommended control strategy for TB
FDC	fixed-dose combination
GDF	Global Drug Facility
GNP	gross national product
HIV	human immunodeficiency virus
ILO	International Labour Organization
IUATLD	International Union Against Tuberculosis and Lung Disease
MDR	multidrug-resistant
MHSA	Mine Health and Safety Act (South Africa)
MOHAC	Mining Occupational Health Advisory Committee
MoU	Memorandum of Understanding
NTP	national TB programme
NGO	nongovernmental organization
ODMWA	Occupational Diseases in Mines and Works Act (South Africa)
PPD	purified protein derivative
SIMRAC	Safety in Mines Research Advisory Committee
TB	tuberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
VCT	voluntary counselling and testing
WHO	World Health Organization

## Glossary

This glossary provides brief definitions of terms used in these guidelines; the terms may have different meanings in other contexts.

adherence to treatment	the patient taking the medicines
anorexia	loss of appetite for food
bacillus	rod-shaped bacterium, e.g. TB bacillus
chemotherapy	treatment with drugs, e.g. anti-TB chemotherapy means treatment with anti-TB drugs
co-infection	infection with different pathogens at the same time, e.g. <i>Mycobacterium tuberculosis</i> and HIV
contacts	people (often family members) close to a TB patient and at risk of infection
counselling	face-to-face communication in which one person (counsellor) helps another (patient/client) to make decisions and to act on them
defaulter	patient stopping treatment before completion
disseminated	spread throughout the body to many different organs
dormant	inactive
drug-resistant TB	a case of TB with TB bacilli resistant to one or more anti-TB drugs
dyspnoea	shortness of breath
extrapulmonary tuberculosis	tuberculosis in organs other than the lungs
haemoptysis	coughing up blood-stained sputum
HIV-negative	absence of antibodies against HIV
HIV-positive	presence of antibodies against HIV
HIV-related TB	TB occurring in a person infected with HIV
HIV status	whether a person is HIV-positive or HIV-negative
HIV test	blood test for antibodies against HIV
home care	providing care for a patient in his home rather than in hospital

incidence	the number of new cases of a disease in a population in a given time (usually 1 year)
latent TB	presence of <i>Mycobacterium tuberculosis</i> in the tissues without causing disease
lesion	an area of disease in the body
multidrug-resistant TB	TB resistant to at least isoniazid and rifampicin (the two most essential anti-TB drugs)
opportunistic infection	an infection that “takes the opportunity” to cause disease when a person’s immune system is weakened
“passive” case-finding	detection of TB cases by active testing (sputum smear) of TB suspects
pleural effusion	accumulation of fluid around the lung
prevalence	the number of cases of a condition in a defined population at a specified point in time
preventive treatment	treatment aimed at preventing disease, e.g. isoniazid for the prevention of TB in certain circumstances
regimen	a drug, or several drugs, given in certain doses for a stated duration
relapse	disease starting again after a patient was declared cured
seroprevalence	the proportion of people testing seropositive (e.g. for HIV) in a defined population at a specified point in time
sputum smear-negative	absence of acid-fast bacilli on sputum microscopy
sputum smear-positive	presence of acid-fast bacilli on sputum microscopy
TB suspect	patient with symptoms suggestive of TB
TB/HIV	the overlapping epidemics of TB and HIV infection
TB/HIV patient	HIV-infected TB patient
tuberculin	protein extracted from TB bacilli, also known as PPD



# CHAPTER 1

## Introduction

### 1.1 Background

Why should employers be interested in TB – and specifically interested in taking steps to contribute to TB control? Firstly, TB contributes to loss of economic productivity in many countries. Secondly, if employers take steps to contribute to TB control, they protect economic productivity. Employers also benefit from a healthier and more productive workforce, from their contribution to social welfare as part of their corporate responsibility, and from a healthier and more prosperous community.

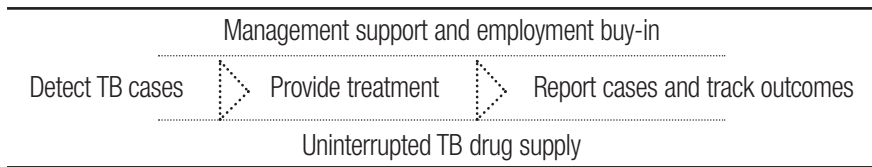
These guidelines indicate the various activities that all employers can undertake to contribute to TB control and how to carry out them out. Most employers will be able to contribute towards the following key components of TB control, within the overall DOTS strategy (see section 2.2) implemented by the national TB programme (NTP):

- identifying TB suspects;
- referring TB suspects for diagnosis;
- helping TB patients to complete their treatment.

Some large-scale employers with a significant number of TB cases among their workforce may wish to set up a workplace DOTS programme (see Figure 1 and Chapter 4).

One of the five key elements of the DOTS strategy is to ensure that TB patients have the support they need to complete their treatment (usually lasting 6 or 8 months), including direct observation of their treatment. Once employees make an adequate recovery following TB diagnosis and initial treatment, they can often receive further treatment while continuing to work. These guidelines provide some examples of employers who have made arrangements for employees to receive their TB treatment in the workplace. These arrangements are designed to suit both the employer, who retains the employee's work contribution, and the employee, who receives treatment in a convenient and accessible way, without loss of income.

Figure 1. Key elements of a successful TB workplace programme



## 1.2 Structure and use of the guidelines

These guidelines are designed to be a practical tool. They provide guidance in choosing suitable TB control activities, and give detailed information on how employers can start and manage these activities. It may be necessary to adapt the guidelines to meet the needs of specific work environments, industries, or subcontractors. Collaboration with local health authorities and the NTP is essential.

Box 1 indicates the additional resources required to support TB control activities. Annex 2 provides a list of available resource materials.

### Box 1. Country resources to use in combination with these guidelines

- Work closely with local health authorities and with the NTP. Your local health and safety officer should be able to give you further details on whom to contact locally and nationally for NTP collaboration.
- Obtain a copy of the NTP manual.
- Obtain copies of any local specific health, labour, or social security regulations with TB.

Chapter 1 provides the rationale for employer involvement in TB control.

Chapter 2 provides background information on TB.

Chapter 3 outlines the principles of employer involvement in workplace TB control.

Chapter 4 describes the steps involved in setting up, running, and monitoring and evaluating a workplace TB control programme.

Chapter 5 describes the process of policy development and finance necessary to establish workplace TB control activities.

Chapter 6 describes how employers can extend the benefits of workplace TB control activities to the local community.

### **1.3 Impact of TB on business**

TB is a global epidemic and therefore a global concern. A commonly used measure of the severity of the TB burden is the incidence rate, i.e. the number of new cases per 100 000 population per year. Figure 2 illustrates TB incidence rates country by country for 2001, which vary from fewer than 10 new cases per 100 000 in north America to more than 300 per 100 000 in parts of Africa and Asia. In countries with a high or rising prevalence of HIV infection, HIV fuels the TB epidemic. Countries with the highest HIV prevalence (e.g. many countries in sub-Saharan Africa) also have high TB incidence rates, and employers find that TB is one of the commonest HIV-related diseases to affect employees.

TB imposes many costs on businesses. The disease strikes mostly at individuals between the ages of 15 and 54 years, i.e. those in their productive prime. In addition to the resultant suffering and loss of workers' income, it disrupts workflow, reduces productivity, and increases both direct costs, related to care and treatment, and indirect costs, such as the replacement and retraining of workers. Without effective treatment, employees with TB will often spend months off work. Given effective treatment, however, many employees can safely return to work within 2–4 weeks.

AngloGold South Africa estimates that each case of TB among unskilled employees in its operations in the Vaal River and West Viltz regions costs US\$ 410 in lost shifts. The company runs a comprehensive TB control programme for the workforce, spending about US\$ 90 per employee each year but saving US\$ 105 through the prevention of active TB among HIV-positive employees. Prompt diagnosis and effective treatment can lead to net cost savings by reducing absenteeism and preventing disease transmission to other workers. However, the savings at the workplace are not the only reason for starting a workplace programme. In high TB-incidence environments, TB is a major contributor to ill health and poverty in a community. Business success is closely linked to the health and prosperity of the community, which is a source



of workers, services, contractors, and customers – a key part of the overall business environment. As part of their corporate responsibility, many businesses have a broad commitment to improving the well-being of the community. A TB control programme is a practical way to demonstrate to the local community that businesses care about their well-being. It can be part of a “local licence to operate”.

Finally, the macroeconomic impact of TB should be considered in terms not only of how it affects a country’s per capita gross national product (GNP), but also of how the disease affects the human capital and lifetime earnings of society. There is no doubt that a sick workforce contributes to an unhealthy economy. Poor labourers and farmers stay poor if they are sick. Improving health is a concrete and measurable way of reducing poverty and inequity, at both country and global level: investments in health are investments in human potential. Tackling the primary diseases that cause poverty is a way of putting back billions of dollars into the national economies of poorer countries. On the global level, TB leads to a decline in worker productivity of the order of US\$ 12 billion annually. In addition, HIV seroprevalence rates of 10–15%, no longer uncommon in certain parts of the world, can translate into a reduction in annual growth rate of GNP per capita of up to 1%. Studies suggest that, on average, 3–4 months of work time per affected employee are lost as a result of TB, resulting in potential losses of 20–30% of annual household income. In addition, there is the further loss of about 15 years of household income as a consequence of the premature death of those affected.

## **1.4 Main stakeholders in workplace TB control activities**

The NTP in each country has the mandate and responsibility for coordinating TB control activities. Successful TB control requires the mobilization of the full range of health care provision, including health services for employees. Workplace TB control activities require active collaboration between the NTP, employers (public and private sector), and employee organizations (e.g. trade unions), plus nongovernmental organizations (NGOs) and private practitioners. Each of the range of health care providers should collaborate with the NTP in undertaking TB activities (Box 2).

Box 2. Guidance for employers in high TB incidence countries

Contact the local public health authorities (e.g. through the health and safety officer) in order to collaborate with the NTP).

- Link your workplace TB control activities with the NTP. If the workplace has a basic health facility, link it with the NTP. The health facility should be able to screen people who have TB symptoms (most importantly cough for longer than 3 weeks), and refer such individuals for diagnostic testing (sputum smear microscopy and chest X-ray as necessary).
- In countries or areas where the NTP is not implementing the DOTS strategy, the diagnosis and treatment of TB will be at local health facilities and the employer could cover any costs incurred by employees.

In most countries, the NTP has a central office at the national ministry of health, with staff in every district and often at the intermediate (e.g. provincial) level. In addition to coordination of TB control activities, the NTP is responsible for:

- setting TB control policy;
- monitoring and evaluating TB programme activities (case-finding and treatment outcomes);
- reporting programme results to the Ministry of Health and to WHO;
- training and supervising staff involved in TB control activities;
- quality control of diagnostic laboratory activities;
- procurement of drugs, diagnostic agents, and other supplies;
- information, education and communication activities;
- advocacy.

All NTPs implementing the DOTS strategy should provide free diagnosis and free treatment.

The global Stop TB Partnership represents a coalition of stakeholders involved in TB control. For example, as a member of the Stop TB Partnership, the World Economic Forum supports employers in their activities against TB, HIV/AIDS, and malaria. The mandate of ILO includes the promotion of workers' rights, including health rights. Various international agencies provide support to countries for their NTP activities, including WHO, the International Union Against Tuberculosis and Lung Disease (IUATLD), NGOs with international activities (e.g. Royal Netherlands Tuberculosis Association), and bilateral development assistance agencies.

## 1.5 Opportunities for workplace TB control activities

Many employers provide health care for their workforce that may include TB control activities. Any employer can provide some or all of the following:

- education and awareness about TB as part of general or occupational employee health education and awareness activities;
- advocacy on TB control;
- referral of employees with TB symptoms to the nearest health facility for diagnosis and treatment;
- support of TB patients during their treatment, including directly observing their treatment.

Individual employers can make different contributions depending on their size and how they arrange their occupational health services. Employers with on-site health clinics can collaborate with the NTP to offer the option of directly observed treatment (DOT) in the workplace. Workers' representatives and organizations can also undertake advocacy and awareness raising, and be a source of volunteers to support TB patients during their treatment, including DOT in the workplace. Some employers may have an outsourcing arrangement, perhaps with local private practitioners, that could be used for referring TB suspects for diagnosis and treatment. Others may provide a health insurance scheme for their employees, in which case they should ensure that the scheme covers TB diagnosis and treatment, in line with NTP policies.

In large workplaces, a significant number of employees may develop TB each year – possibly enough to justify the establishment of a workplace TB programme. For example, in a country where the annual overall TB incidence rate is 300 cases per 100 000 population, about 60 cases per year may be expected among a workforce of 20 000. An employer with a workforce of this size could establish a workplace DOTS programme in collaboration with the NTP. This would mean putting in place the five elements of the DOTS strategy shown in Table 1. The employer could arrange for staff of the workplace clinic to help in identifying TB suspects and diagnosing cases, as well as helping patients to complete their treatment. The workplace programme would report the numbers and types of TB cases found and their treatment outcomes to the NTP.

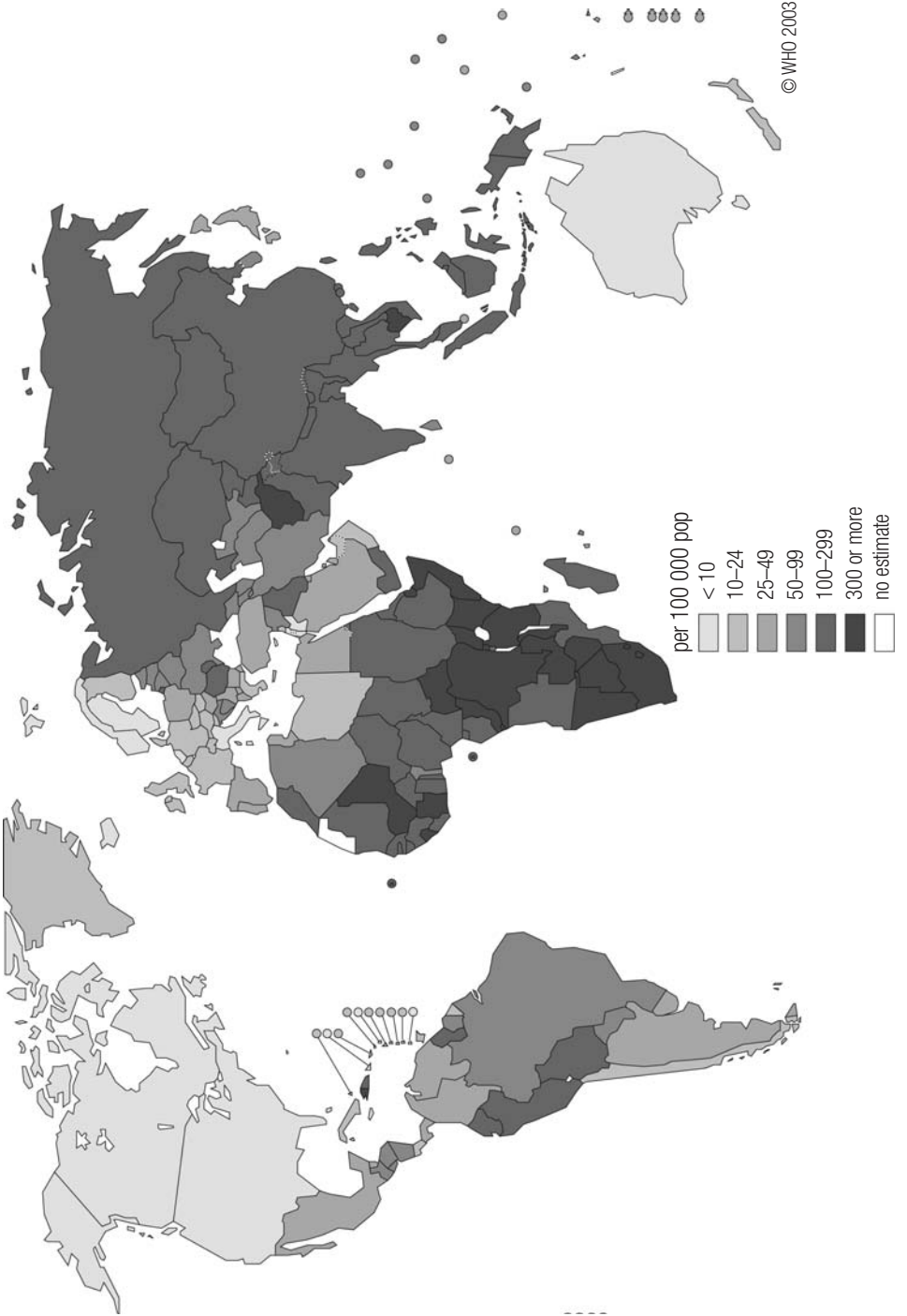
Table 1. The five elements of the DOTS strategy

DOTS components	Method	Why it is important in the workplace
1. Political commitment	<ul style="list-style-type: none"> <li>• Government/senior management accords priority for TB control</li> </ul>	<ul style="list-style-type: none"> <li>• Only strong commitment can truly ensure that sufficient resources are mobilized and sustained over time</li> </ul>
2. Good-quality diagnosis	<ul style="list-style-type: none"> <li>• This relies primarily on sputum-smear microscopy of patients presenting to health facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Early detection of infectious cases is essential to prevent further spread of TB</li> <li>• Inability to diagnose promptly and accurately can result in prolonged illness, treatment failure, and/or development of multidrug-resistant TB (MDR-TB)</li> </ul>
3. Good quality drugs	<ul style="list-style-type: none"> <li>• A process is established to guarantee uninterrupted supply of approved anti-TB drugs</li> </ul>	<ul style="list-style-type: none"> <li>• Inability to guarantee drug quality can result in treatment interruption and/or development of MDR-TB</li> </ul>
4. Short-course chemotherapy given under direct observation	<ul style="list-style-type: none"> <li>• A health worker or another trained person (usually not a family member) watches the patient swallow anti-TB drugs</li> </ul>	<ul style="list-style-type: none"> <li>• Inability to monitor drug intake during the intensive treatment phase can result in irregular medication, treatment failure and/or development of MDR-TB</li> </ul>
5. Systematic monitoring and accountability	<ul style="list-style-type: none"> <li>• Treatment progress and outcome is monitored by microscopy for infectious cases</li> <li>• Cohort analysis is used for evaluation of programme performance</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring and evaluation is essential for programme quality control and sustained improvement</li> </ul>

Table 2. Workplace settings with increased risk of TB

Workplace setting	Cause of increased occupational risk
• Oil and gas industries and plantations	Cramped living quarters and potentially poor health conditions
• Mining industry	Silicosis and cramped living quarters
• Prisons	Exposure of prisoners and prison employees to prisoners with TB in often cramped conditions
• Health centres/hospitals	Can be contracted from other infected individuals under care
• Businesses with large migrant workforce	Poverty, poor sanitation and living conditions, birth in countries with high TB infection rates

Figure 2. Estimated TB incidence rates, 2001



## **1.6 Occupational risk of TB**

Where employees are at particular risk of contracting TB in the workplace, employers have a particular responsibility to implement specific TB control activities. The increased risk of contracting TB may be the result either of employees living in cramped quarters where health conditions may be poor or of occupational exposure to special risk factors. TB rates in such situations tend to exceed the national average. For example, incidence rates among gold miners in South Africa are 15 times higher than the country average. Table 2 provides some examples of workplace settings with increased incidence of TB.

## **1.7 Coordination with NTP**

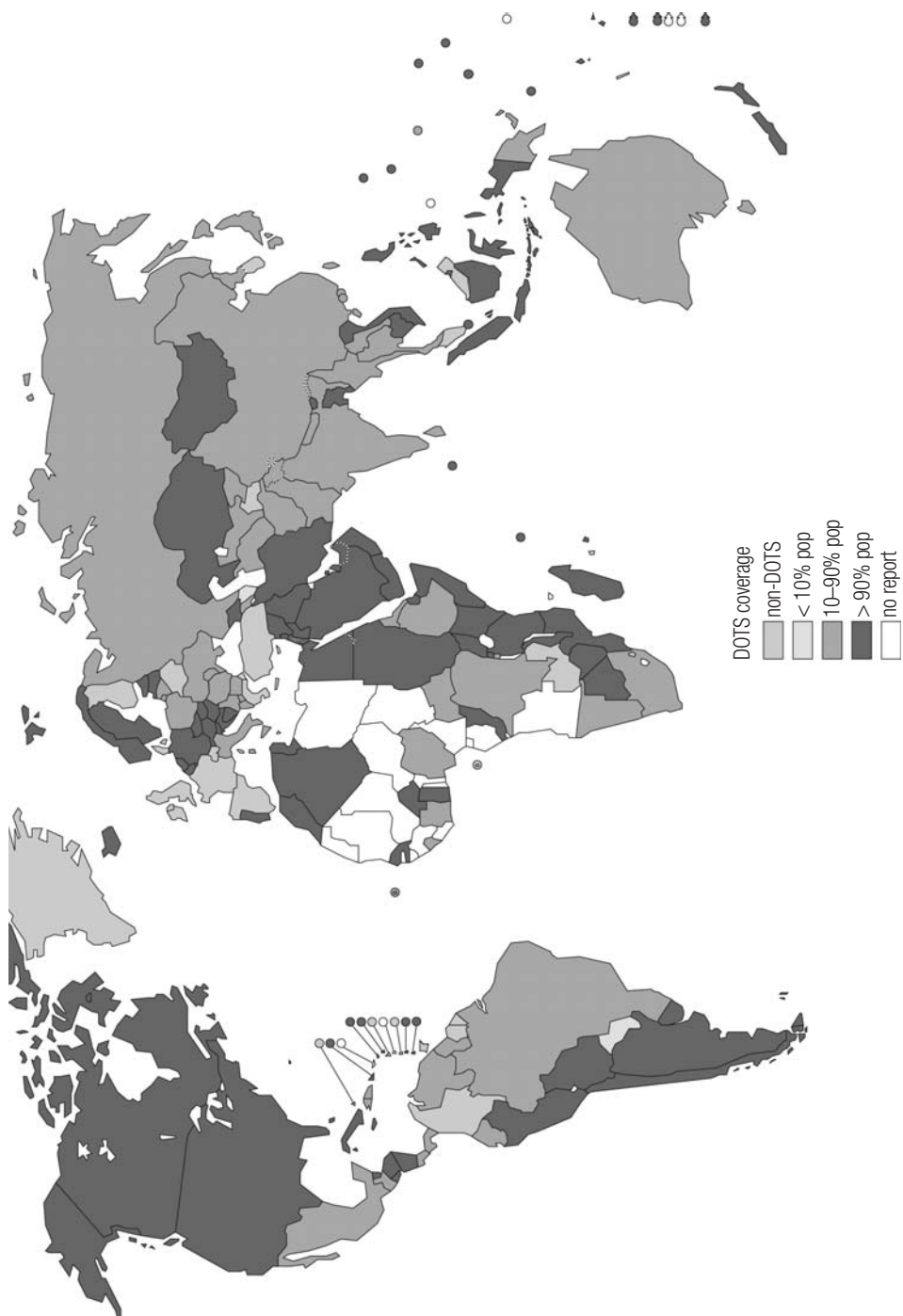
It is essential to coordinate workplace TB control activities with the NTP, and most countries have NTPs that implement the DOTS strategy (Figure 3). However, if there is no DOTS coverage locally, employers should contact the NTP to negotiate its implementation, e.g. through a memorandum of understanding (MoU) (see Annex 1).

## **1.8 Ensuring sustainability of TB control activities**

It is essential that employers make a commitment to sustaining TB control activities (in order to decrease the risk of generating drug-resistant TB) by:

- building community capacity in collaboration with the NTP;
- making plans for transfer of responsibility for TB control activities if the employer ceases operations;
- making a commitment to continuing responsibility for TB control activities.

Figure 3. Implementation of DOTS, 2001



## Suggestions for further reading

### TB stakeholders

*Global Plan to Stop TB*. Geneva, World Health Organization, 2000 (document WHO/CDS/STB/2000.16; available at <http://www.stoptb.org/GPSTB>)

### TB epidemiology

*Global tuberculosis control: WHO report 2003. Surveillance, planning, financing*. Geneva, World Health Organization, 2003 (document WHO/CDS/TB/2003.316; available at <http://www.who.int/whr/2003>).

### TB and economics

*Macroeconomics and health: investing in health for economic development. Report of the Commission on Macroeconomics and Health*. Geneva, World Health Organization, 2001.  
*World Development Report 1993: Investing in health*. Washington, DC, World Bank, 1993

### Occupational health

Bone A et al., eds. *Tuberculosis control in prisons: a manual for programme managers*. Geneva, World Health Organization, 2000 (document WHO/CDS/TB/2000.281).

Davies JC. Silicosis and tuberculosis among South African gold-miners – an overview of recent studies and current issues. *South African Medical Journal*, 2001, 91:562–566.

Evian C. HIV/AIDS: new challenges for primary and occupational health care practice in the workplace. *Occupational Health Southern Africa*, 1998, 4:14–17.

Guild R et al., eds. *Handbook of occupational health practice in the South African mining industry*. Johannesburg, Safety in Mines Research Advisory Committee, 2001.

Harries AD et al. Delays in diagnosis and treatment of smear-positive tuberculosis and the incidence of tuberculosis in nurses in Blantyre, Malawi. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 1997, 91:15–17.

Maher D et al., eds. *Guidelines for the control of tuberculosis in prisons*. Geneva, World Health Organization, 1998 (document WHO/TB/98.250).

Rosenman KD, Hall N. Occupational risk factors for developing tuberculosis. *American Journal of Industrial Medicine*, 1996, 30:148–154.

Schutke JM et al. Tuberculosis cases reported among migrant farm workers in the United States, 1993–1997. *Journal of Health Care for the Poor and Underserved*, 2001, 12:311–322.





# CHAPTER 2

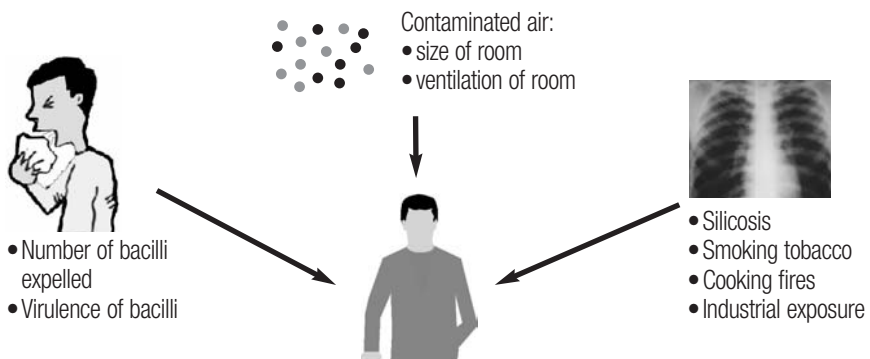
## Background information on TB

### 2.1 TB and how it spreads

TB is a treatable infectious disease caused by *Mycobacterium tuberculosis*. This bacillus is usually spread when people with TB infection in their lungs cough and spread germs into the air. When an infected person breathes in these germs, they can reach the lungs. The germs can then spread from the lungs to other parts of the body via the bloodstream, the lymphatic system, or by direct extension to other organs. TB can affect any part of the body. On average, in 80% of cases TB affects the lungs (pulmonary TB); in 20% of cases TB affects other parts of the body (extrapulmonary TB) such as the pleura, lymph nodes, spine and joints.

Extended, close, indoor contact is usually required for TB transmission from one person to another. Figure 4 shows the factors affecting TB transmission.

Figure 4. Factors affecting TB transmission



Exposure to *M. tuberculosis* from an infectious case can lead to infection that is asymptomatic. In some cases, progression from infection to development of disease follows immediately after infection but in others occurs much later (following a period when infection is latent) or not at all. The differences between latent infection and active TB disease are summarized in Table 3.

Table 3. Difference between latent TB infection and active TB disease

Latent TB infection	Active TB (e.g. pulmonary)
• Few TB bacilli in the body	• Many TB bacilli in the body
• No symptoms	• Symptoms (e.g. cough, weight loss) usually present
• Tuberculin skin test reaction usually negative	• Tuberculin skin test reaction usually positive
• Chest X-ray normal	• Chest X-ray usually abnormal
• Sputum smears and cultures negative	• Sputum smears and cultures usually positive
• Not infectious	• Infectious before effective treatment

People infected with *M. tuberculosis* generally do not have symptoms and are not infectious. In the absence of HIV infection, 90% will never become ill with TB. However 10% of these infected persons will develop active TB disease. The chance of developing active TB is highest within 1–2 years after infection and then steadily lessens with time. Active TB may occur not only by reactivation of latent infection but also by re-infection with *M. tuberculosis*.

The presence of HIV infection increases the risk of progression from infection with *M. tuberculosis* to active TB disease: a person infected with both organisms has an average 10% annual risk of developing active TB disease.

## 2.2 The DOTS strategy for TB control

For control of TB, WHO recommends the DOTS strategy, which consists of the five elements shown in Table 3. National implementation of the DOTS strategy cuts the cycle of TB transmission in the community. Table 3 also highlights the relevance of each of these five components to TB control in the workplace.

Effective implementation of the DOTS strategy saves lives through decreased TB transmission, decreased risk of emergence of drug-resistance, and decreased risk for individual TB patients of treatment failure, TB relapse, and death. Chapters 3 and 4 provide more details on each of these elements and how to implement them in the workplace.

## 2.3 TB and HIV

HIV infection is the single most powerful factor that increases the risk of progression from TB infection to active TB disease. With increasing immunosuppression, HIV-infected individuals are increasingly at risk of developing TB. Thus, the higher the HIV prevalence in a population, the greater will be the impact of HIV on TB incidence. In addition, HIV often makes the management of TB more difficult:

- **TB case-fatality is higher** — TB case-fatality refers to deaths among TB patients during treatment, whether as a direct result of TB or caused by another HIV-related disease. Thus HIV-related diseases other than TB contribute to an increased risk of death among HIV-infected TB patients during TB treatment. For example, HIV-infected TB patients may die of HIV-related Kaposi sarcoma during TB treatment.
- **Time off work may be longer** — Time off work may be extended because of the other HIV-related diseases that HIV-infected TB patients often develop.
- **TB recurrence rate is higher** — The progressive weakening of the immune system caused by HIV predisposes HIV-infected TB patients to TB recurrence even after successful TB treatment.

Because of the interaction between TB and HIV, workplace health programmes should consider providing integrated TB/HIV services. Where HIV prevalence is high, providing separate TB and HIV services may result in higher costs for employers than providing integrated services. Tackling the joint stigma of TB and HIV is important in order to encourage people to come forward for diagnosis and treatment.

## 2.4 Multidrug-resistant TB

Drug-resistant TB is caused by inconsistent, partial, or incorrect treatment of TB. Multidrug-resistant TB (MDR-TB) is a specific form of drug-resistant TB, with resistance to at least isoniazid and rifampicin, the two most essential TB drugs. It is possible to treat MDR-TB but only with expensive and potentially toxic treatment lasting up to 2 years. Full implementation of the DOTS strategy is a priority for preventing the emergence of drug-resistant TB.

Since 1994, WHO and IUATLD have conducted anti-TB drug resistance surveys through a network of subregional laboratories and investigators; these have unveiled foci of high MDR-TB prevalence in various settings worldwide. In response to the seriousness of MDR-TB as a public health problem in several countries, the DOTS-Plus Working Group was established in 1999 to promote improved management of MDR-TB in resource-poor countries (see section 4.7). The DOTS-Plus strategy is based on principles similar to those of the DOTS strategy and for the most part uses the same infrastructure. Experience is growing of success in implementing the DOTS-Plus strategy in various settings to identify and treat MDR-TB patients and hence to stop the cycle of transmission.

### **Suggestions for further reading**

Crofton J, Horne N, Miller F. *Clinical tuberculosis*. London, Macmillan, 1992.

Davies PDO. *Clinical tuberculosis*. London, Chapman & Hall Medical, 1994.

*Global tuberculosis control: WHO report 2003*. Surveillance, planning, financing. Geneva, World Health Organization, 2003 (document WHO/CDS/TB/2003.316; available at: <http://www.who.int/whr/2003>).

Harries AD, Maher D. *TB/HIV: A clinical manual*. Geneva, World Health Organization, 1996 (document WHO/TB/96.200. 1996; available at: [http://whqlibdoc.who.int/hq/1996/WHO\\_TB\\_96.200.pdf](http://whqlibdoc.who.int/hq/1996/WHO_TB_96.200.pdf)).

Maher D, Mikulencak M. *What is DOTS? A guide to understanding the WHO-recommended TB control strategy known as DOTS*. Geneva, World Health Organization, 1999 (document WHO/CDS/CPC/TB/99.270; available at: [http://whqlibdoc.who.int/hq/1999/WHO\\_CDS\\_CPC\\_TB\\_99.270.pdf](http://whqlibdoc.who.int/hq/1999/WHO_CDS_CPC_TB_99.270.pdf)).

*Treatment of tuberculosis: Guidelines for national programmes*, 3rd ed. Geneva, World Health Organization, 2003 (document WHO/CDS/TB/2003, 313; available at: [http://whqlibdoc.who.int/hq/2003/WHO\\_CDS\\_TB\\_2003.313.pdf](http://whqlibdoc.who.int/hq/2003/WHO_CDS_TB_2003.313.pdf)

# CHAPTER 3

## TB control in the workplace: opportunities, principles, and examples

### 3.1 Why the workplace offers good opportunities for TB control activities

The advantages of the workplace for TB control activities are that workers attend on a regular basis, communication systems are in place, and existing structures, services, and facilities can be used for prevention, care, and support.

Many employers have the management skills needed to implement successful control activities, including strong analytical processes and project management, good forecasting of supply and demand requirements, and tracking of results. The same rigorous approach applied to running business initiatives is required for a large-scale organization running a DOTS programme to succeed, e.g. correct staffing capacity, funding, and management support. Programme monitoring should also be in place, in line with corporate practices such as quarterly business progress reviews.

### 3.2 Guiding principles for implementing TB control activities at the workplace

Before embarking on workplace TB control, it is important to review the following principles for implementation. All employers involved in TB control should respect these, especially the health staff in contact with the affected employees.

#### PROTECT PATIENTS

- **Always respect the patient's rights** — Maintaining the confidentiality of medical conditions and medical records is crucial to giving employees confidence to undergo treatment. Lack of confidentiality can lead to discrimination as well as delayed diagnosis and treatment. *Confidentiality means that only the staff directly involved in the individual patient's medical*

*care know that patient's medical status and have access to his or her records.* Medical staff should never divulge the medical status of employees to any other workers or to the management. They should give guidance to line management only on whether employees will need time off and whether there should be any change to their workload and tasks because of their health status. Options should be offered for DOT (as either an outpatient or an inpatient) that respect patient rights.

- **Offer social welfare benefits to TB patients and their families** — Social welfare provided to workers and their families can help patients complete their treatment. Welfare benefits may consist of free treatment and services, maintaining salary during treatment (or providing compensation for loss of income), free transport to health facilities, and food support. Importantly, to motivate the patient to continue treatment, social support should be adapted to the delivery and duration of the treatment.

- **Help TB patients to tailor their workload/tasks to their state of health** — For at least the first 2–4 weeks of TB treatment, a patient should be on leave of absence, with DOT arranged for his or her convenience. The employee may often then resume work, if necessary with an adjusted workload and modified tasks until fitness returns. For example, it may be possible for an employee who is normally engaged in heavy labour to do office work for a few months.

#### **ENSURE A SAFE WORKPLACE ENVIRONMENT**

- **Use education campaigns to decrease stigma** — Effective health education campaigns should address negative attitudes towards people with TB. Traditionally TB is viewed as a deadly disease of the poor, and the strong social stigma it provokes makes it more difficult for people with TB to seek diagnosis and treatment. This can be countered by greater knowledge and understanding. For example, education should stress that everyone is vulnerable to TB, that most people with TB cease to be contagious after 2–4 weeks of treatment, and that the disease is usually curable.

- **Develop and implement clear management policies** — The employer's policies on confidentiality, discrimination, length of time off allowed for medical treatment, and job modification when necessary should be clearly outlined and made easily accessible. They should be clearly explained to employees with TB as soon as such employees are identified and should. Ensure prompt recognition and referral of TB suspects. Reducing the delay between onset of symptoms and diagnosis and treatment is crucial to decreasing the risk of TB transmission.

• **Implement environmental controls** — Environmental control of TB refers to implementing environment-associated interventions to prevent or reduce airborne transmission from unsuspected cases or from diagnosed cases of TB to non-infected employees.

Most TB cases are result of airborne transmission of infection. Environmental factors that enhance TB transmission are:

- small, enclosed spaces;
- areas that lack sufficient ventilation to clean the air through dilution or removal of infectious droplet nuclei;
- ventilation systems recirculating air.

The overall objective of cost-effective interventions in the workplace should therefore be to control the spread of TB by minimizing the concentration of airborne infective droplet nuclei. Achieving this requires systems that ensure a high flow of fresh air into the workplace environment. It also involves keeping away from other workers with active TB until 2–4 weeks after starting treatment. Figure 5 outlines a range of methods, of varying cost, to ensure air circulation.

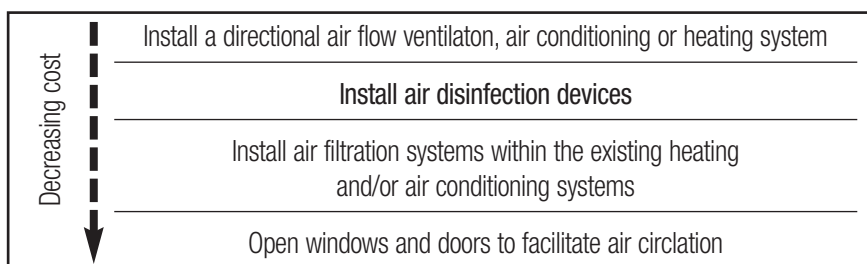


Figure 5. Environmental interventions and their cost

Additional research is needed in the use of environmental controls, particularly with respect to the reduction of risk resulting from different levels of dilution ventilation and methods for predicting the effectiveness of the various applications of germicidal radiation.

#### **USE PARTNERSHIP FOR BUY-IN**

Ensure collaboration with the NTP. Negotiate and implement TB control activities with all partners. Additionally, it is particularly important to work with workers' organizations to maximize awareness and understanding of the disease and of the programme of control activities.



### 3.3 Gain senior management commitment to ensure successful TB control activities

In the business sector, managers set the strategic vision and mission statements for the company. They also establish a culture and context for growth, profitability, and production. The same approach is helpful when developing workplace TB control activities. Senior managers play an important leadership and advocacy role in promoting and developing workplace health programmes. When managers endorse and approve the policies for preventing and treating TB among their workforce, they are placing a value on workers' health and essentially integrating it into the company's business culture.

Effective TB control activities require sustained commitment and consistent policy. Box 3 provides a checklist of essential management actions.

Box 3. Checklist of management actions required for successful workplace TB control activities

**At launch:**

- Ensure that the programme is developed in conjunction with workers' representative.
- Ensure that the programme is linked to the local NTP.
- Be fully aligned to the programme objectives and committed to their long-term implementation.
- Ensure that the workforce understands and respects the importance of the programme.
- Ensure that the workforce understands the new policies and their role in implementing them.
- Designate a senior management representative and workers' representative, in addition to the medical personnel, to be responsible for overseeing the proper functioning of the workplace TB control programme.

**During the programme:**

- Ensure that policies are being enforced.
- Ensure that cases are being notified and reports of treatment outcomes are being sent to the NTP.
- Reinforce positive advocacy for the programme.

**Programme reviews:**

- Resolve issues and capitalize on opportunities to extend success to contractors and the local community.
- Allocate appropriate resources in a timely fashion.

### **3.4 Case study of small employers' contribution to TB control activities**

#### **TB CARE ASSOCIATION, CAPE TOWN, SOUTH AFRICA**

The TB Care Association in Cape Town has established a system for referring TB patients from the government TB clinic to workplaces that have joined the scheme. The TB coordination officer interviews and counsels each patient in the place of employment about completing treatment, trains the workplace TB treatment supporter, and monitors compliance with treatment. A good relationship between the treatment supporter and the TB patient is crucial. The TB coordination officer educates all the employees about TB and HIV through health education talks. This system also provides the opportunity for identifying TB contacts in the workplace and for referring them for screening in the TB clinic.

The advantages of this programme are:

- Workplace management supports the scheme.
- The patients' colleagues understand TB and support the patients.
- DOT is available in this workplace.

Thirty people have been educated about TB, can recognize the signs and symptoms of TB, and indirectly become part of a peer educational team in their families and communities.

### **3.5 Case studies of workplace DOTS programmes implemented by large employers**

The following two case studies illustrate how a TB workplace programme can be structured and what results can be achieved in two very different work environments.

## CASE STUDY 1

### TB CONTROL IN A HIGH-RISK WORKPLACE ENVIRONMENT: THE ANGLGOLD PROGRAMME

---

#### **Company background**

AngloGold is a large international gold-mining company. At the end of 2001, it employed about 50 000 people worldwide, of whom 44 000 were in South Africa. The company is in a high-prevalence business sector and country. In addition to this, the local high HIV prevalence further increases the incidence of active TB in the workforce.

#### **AngloGold South Africa TB status**

The number of active cases detected rose by about 8% per year, from about 10 per 1000 in 1990 to 23 per 1000 in 2001. This increase was accompanied by a sharp rise in direct TB-related medical expenditure incurred by the company. In 2001, the total cost of TB care, including overheads, amounted to US\$ 2775 per case. In addition, AngloGold estimated that the cost of lost shifts among lower-level employees was about US\$ 410 per case.

#### **TB workplace programme key elements**

*The AngloGold TB programme* is comprehensive and covers both TB and HIV. The programme design is:

- In line with the WHO-recommended DOTS strategy,
- Compliant with the national TB guidelines,
- Compliant with South African laws.

*The programme structure includes:*

- Coverage of each employee, one registered spouse and children for free TB detection and treatment.
- Detection of cases primarily through individuals self-presenting with symptoms suggestive of TB. In 2002, active case detection was initiated through joint symptom and radiological screening every 6 months.
- A workplace laboratory for sputum collection and testing.
- An X-ray facility for screening and diagnosis.
- Diagnosis of cases based on sputum smears, culture, and a chest radiograph.
- Treatment using standardized drug regimens in accordance with NTP guidelines.
- Quarterly and annual recording of case-finding and reporting of treatment outcomes by cohort analysis.

### **HIV/TB workplace programme components**

The standard TB programme is closely linked to AngloGold's HIV/AIDS programs. All patients who attend the HIV wellness clinic participate in an active TB detection programme. All TB patients are encouraged to attend voluntary counselling and testing (VCT) for HIV.

### **Programme results and costs**

- The treatment success rate among smear-positive cases exceeds 85%.
- About 87% of the TB cases in the first quarter of 2002 were HIV-related.
- A cost-benefit analysis conducted by AngloGold indicates that an HIV VCT programme combined with the TB detection and prevention programme would cost US\$ 90 per employee. It would generate US\$ 105 per employee in benefits by preventing active TB in 50% of the HIV-positive individuals.

*This case study is a Summary of the World Economic Forum Global Health Initiative Case Study on Anglo Gold's TB programme available at: <http://www.weforum.org/globalhealth/cases>.*

## **CASE STUDY 2**

### **TB CONTROL IN A HIGH-PREVALENCE COUNTRY: THE YOUNGONE INDUSTRIES PROGRAMME IN BANGLADESH**

---

#### **Company background**

Youngone Industries is a Republic of Korea company, established in 1998, which produces sporting goods such as bags, shoes, and jackets. With approximately 22 000 employees it is the largest employer in the Chittagong Export Processing Zone in Bangladesh. Eight-five percent of the employees are women aged between 18 to 30. The company is in a high-prevalence business sector and country.

#### **Youngone Industries and TB control activities**

Youngone Industries gives high priority to the well-being of its employees. In 1996, the Chief Medical Officer of the company began to identify TB as a serious health problem for the employees. In 2000, the TB incidence rate in Chittagong city was higher than the national average of 242 per 100 000, and the Bangladesh NTP expanded activities in the area with the objectives of:

- curing 85% of the detected sputum smear-positive pulmonary TB cases
- detecting 30% of existing cases of sputum smear-positive pulmonary TB in the short term, and 70% in the long term.

### **TB workplace programme key elements**

*The Youngone Industries programme* is run in partnership with the NTP in Chittagong city and promotes the concept that “people should not be afraid of TB”. There is sustained high-level management and company commitment to TB control and prevention. The programme design is:

- in line with the WHO-recommended DOTS strategy,
- in line with the Bangladesh NTP,
- operated in conjunction with the local NTP, which trains Youngone medical staff on the DOTS strategy.

*The programme structure includes:*

- A comprehensive education programme that includes the teaching of basic hygiene.
- A team of health counsellors (approximately 1 per 500 employees) who encourage individuals with a cough for a period of more than 3 weeks and loss of appetite to come forward for TB screening.
- Screening for TB, with referral for diagnosis at the local government hospital.
- A workplace laboratory for sputum collection and microscopy.
- A focus on preventing stigmatization of or discrimination towards employees with TB.
- A set of environmental measures to improve ventilation and workplace cleanliness.

*Key workplace policies that are fundamental to the programme success are the following:*

- Employees will not be dismissed if they test positive for TB.
- Employees with TB receive free treatment.
- Employees with TB can return to work as soon as their sputum test is negative (normally after 2–3 weeks)

### **Programme results**

- From January to August 2002, 189 TB suspects were examined with sputum microscopy and X-ray.
- A total of 63 cases were identified among the 22 000 employees; 29 were sputum-positive. All 29 cases converted to sputum smear-negative and 4 cases were cured.
- Treatment for the remaining 33 cases is continuing.
- Remarkably, there have been no cases of interrupted therapy.

# CHAPTER 4

## How to implement TB control activities in the workplace (as part of the DOTS strategy)

This chapter describes the range of TB control activities that can be undertaken in the workplace as part of the DOTS strategy and provides guidance on their implementation. Different employers may wish to take responsibility for different control activities. For example, many will want to be able to contribute to TB case detection, by identifying TB suspects and referring them for diagnosis. Many will also want to support any TB patients among the workforce to help them to complete their treatment; this support includes directly observed treatment (DOT) in the workplace. The largest employers in countries with high TB incidence may find that they have sufficient numbers of TB patients among their employees to justify an entire DOTS programme in the workplace.

Full details on implementing the DOTS strategy for TB control are available from the WHO Stop TB Department. *Treatment of tuberculosis: guidelines for national programmes\** is a useful reference manual.

### 4.1 Detecting TB cases in the workplace

Until they are cured or die, patients with pulmonary TB have the potential to infect others. Prompt case-finding is therefore a priority: the sooner patients receive a correct diagnosis of TB, the sooner they can start treatment and cease to be infectious. In countries with high TB incidence, the most cost-effective approach to detecting TB cases is identifying cases among people who present at health services with symptoms of the disease.

Detection of TB cases requires two steps: identifying TB suspects and making a diagnosis of TB among people identified as TB suspects.

---

\* *Treatment of tuberculosis: guidelines for national programmes*, 3rd ed. Geneva, World Health Organization, 2003 (document WHO/CDS/TB/2003.313; available from the Information Resource Centre, Communicable Diseases, World Health Organization, 1211 Geneva 27, Switzerland (cdsdoc@who.int)).

## IDENTIFYING SUSPECTS

Identifying TB suspects involves asking people about symptoms of TB when they present at health services. The most important symptom of pulmonary TB is cough for 3 weeks or more. Other common symptoms include weight loss and fever. Health education is crucial to ensure that TB suspects realize the importance of their symptoms and the need to seek help. Training of health staff is also important so that TB suspects can be identified among people seeking help with different symptoms.

Employees need investigation for TB if they have the following symptoms:

- persistent cough of 3 weeks or more;
- sputum production, particularly if blood stained.

Additional symptoms may include:

- loss of appetite and weight loss;
- night sweats and fever;
- malaise (general fatigue and weakness);
- chest pain and shortness of breath.

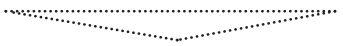
## DIAGNOSING TB

Making a diagnosis of TB among people identified as TB suspects involves referral for a diagnostic test. The primary diagnostic test to confirm the most infectious form of pulmonary TB is sputum smear microscopy; chest X-ray is also important and will often detect pulmonary TB. Training of health staff to recognize TB suspects and refer them for diagnosis is essential.

The largest employers may have either on-site health facilities for TB diagnosis (sputum smear microscopy and X-ray) or outsourcing arrangements for referral of TB suspects for diagnosis. Many employers will directly refer TB suspects for diagnosis at the nearest health facility.

In settings where TB programmes achieve high rates of treatment success, it is useful to intensify TB case-finding by concentrating efforts among high-risk groups, including people with HIV and employees working in high TB risk occupations. Figure 6 outlines the main features of case-finding using two approaches – detection of cases among people presenting to health services with symptoms, and a more intensified approach. Box 4 summarizes the steps to be taken following TB diagnosis.

Figure 6. Main features of case-finding using two approaches: detection among people presenting to health services with symptoms and a more intensified approach

When recommended	Case detection among people self-presenting	Important points
Most settings (in line with NTP guidelines)	Need to raise awareness among employees and health staff of symptoms of TB in order to identify TB suspects and refer them for diagnosis	Decreased delays between onset of symptoms and start of treatment lead to decreased risk of spread TB
In settings, achieving high rates of treatment success among groups at high risk of TB (e.g. Miners)	 <p data-bbox="458 578 744 606"><b>Intensified TB case detection</b></p> <p data-bbox="418 638 783 731">A range of measures are available, including screening of high-risk groups and assessing the close contacts of infectious TB cases.</p>	This approach is likely to cost more than the standard one, but should yield the detection of more TB cases with less diagnostic delay

#### Box 4. Steps following TB diagnosis

1. Maintain patient confidentiality at all times.
2. Reassure employees with TB that treatment is effective.
3. Immediately notify the case to the local NTP officer.
4. Employees can return to work once fit enough and no longer infectious (normally after the first few weeks of treatment). Employers should not dismiss employees with TB.
5. Collaborate in case management with the local NTP officer, for example by arranging DOT in the workplace and monitoring follow-up.
6. Collaborate with the local NTP officer in contact tracing and evaluating the risk to TB transmission in that particular workplace.
7. Contact the local or regional health authorities regarding laws and regulations in the area.



## 4.2 Treatment of TB patients

### STANDARD CLASSIFICATION OF TB CASES

Cases of TB among employees should be classified to ensure that correct treatment is administered, in accordance with NTP guidelines (see Table 5). Classification is based on a number of factors, including the site of TB, degree of infectiousness of pulmonary TB, similarity in clinical presentation, and previous history of TB.

Using international guidelines, the NTP provides a standard treatment regimen for each diagnostic category. Each treatment regimen consists of a combination of first-line anti-TB drugs: isoniazid (H), rifampicin (R), pyrazinamide (Z), streptomycin (S), and ethambutol (E). Table 5 shows the recommended treatment regimens for each diagnostic category. Ethambutol is generally preferred to streptomycin because it is less expensive and is taken orally rather than being injected (streptomycin is injected). Treatment is in two phases – an intensive phase (2 or 3 months) and a continuation phase (4 or 6 months). The aim of the initial intensive phase is to kill TB bacilli rapidly. This is usually accompanied by a marked reduction in or disappearance of symptoms. The aim of the continuation phase of treatment is to destroy any lingering bacilli that could trigger a relapse. **Always use the standard TB treatment regimens recommended by the NTP in your country.**

The use of fixed-dose combination (FDC) tablets simplifies drug administration. FDCs incorporate two or more anti-TB drugs within the same tablet. Using FDCs also reduces the risk of drug resistance.

### RECOMMENDED TREATMENT REGIMENS FOR TB DIAGNOSTIC CATEGORIES

There are several possible treatment regimens. Those recommended by an NTP depend on the national budget in the country in question, access of patients to primary health care services, qualifications of health staff at peripheral level, and current best medical practice. The regimen recommended for each patient depends on the diagnostic category for that patient. Table 5 shows alternative regimens for each diagnostic category, which can be used under various circumstances and in certain subpopulations. NTPs should decide at national level on the most appropriate regimens to be followed.

Table 5. Recommended treatment regimens for each diagnostic category<sup>a</sup>

TB diagnostic category	TB patients	TB treatment regimens	
		Initial phase (daily or 3 times weekly) <sup>b</sup>	Continuation phase (daily or 3 times weekly) <sup>b</sup>
<b>I</b>	New smear-positive patients New smear-negative pulmonary TB with extensive parenchymal involvement Severe concomitant HIV disease or severe forms of extrapulmonary TB	2 months HRZE <sup>c</sup>	4 HR or 6HE daily <sup>d</sup>
<b>II</b>	Previously treated sputum smear-positive pulmonary TB: - relapse - treatment after interruption - treatment failure <sup>e</sup>	2 HRZES / 1 HRZE	5 HRE
<b>III</b>	New smear-negative pulmonary TB (other than in Category I) Less severe forms of extrapulmonary TB	2 months HRZE <sup>f</sup>	4 HR or 6 HE daily <sup>d</sup>
<b>IV</b>	Chronic and MDR-TB cases (still sputum-positive after supervised re-treatment) <sup>g</sup>	Specially designed standardized or individualized regimens are suggested for this category <sup>h</sup>	

a. Reproduced from *Treatment of tuberculosis: guidelines for national programmes*, 3rd ed. Geneva, World Health Organization, 2003 (document WHO/CDS/TB/2003.313).

b. Direct observation of drug intake is required during the initial phase of treatment in smear-positive cases, and always in treatment including rifampicin.

c. Streptomycin may be used instead of ethambutol. In TB meningitis, ethambutol should be replaced by streptomycin.

d. This regimen may be associated with a higher rate of treatment failure and relapse compared with the 6-month regimen with rifampicin in the continuation phase.

e. Whenever possible, drug sensitivity testing is recommended before prescribing Category II treatment in failure cases. For patients with proven MDR-TB, Category IV regimens are recommended.

f. Ethambutol may be omitted during the initial phase of treatment for patients with non-cavitary, smear-negative pulmonary TB who are known to be HIV-negative, patients known to be infected with fully drug-susceptible bacilli, and young children with primary TB.

g. Contacts of patients with culture-proven MDR-TB should be considered for early culture and sensitivity testing.

h. See Chapter 5 of *Treatment of tuberculosis: guidelines for national programmes*, 3rd ed. Geneva, World Health Organization, 2003 (document WHO/CDS/TB/2003.313).

There is a standard code for TB treatment regimens. An abbreviation (shown in Table 5) is used for each anti-TB drug. A regimen consists of two phases: an initial phase and a continuation phase. The number before a phase is the duration of that phase in months. A subscript number (e.g. 3) after a letter is the number of doses of that drug per week. If there is no subscript number after a letter, treatment with that drug is daily. An alternative drug (or drugs) appears as a letter (or letters) in parentheses.

*Examples — 2 SHRZ / 6 HE* — This is a common regimen.

**Initial phase is 2 SHRZ.** The duration of the phase is 2 months. Drug treatment is daily (no subscript number after the letters), with streptomycin (S), isoniazid (H), rifampicin (R) and pyrazinamide (Z).

**Continuation phase is 6 HE.** The duration of the phase is 6 months. Drug treatment is daily, with isoniazid (H) and ethambutol (E).

### 4.3 Promoting adherence to treatment

It is well documented that at least 30% of all patients receiving self-administered treatment will not adhere to treatment in the first 2 to 3 months (the initial phase) of treatment. The consequence for patients of non-adherence to treatment is the risk of treatment failure; the public health consequence is the risk of emergence of drug resistance. Drug-resistant TB is costly and difficult to treat.

WHO recommends a range of measures, including directly observed treatment, to promote adherence to TB treatment. Other measures include placing the patient at the centre of TB control activities; ensuring confidentiality and consideration of patients' needs; organizing TB services so that the patient has treatment as close to home as possible or in the workplace; considering incentives; identifying potential problems in advance; keeping accurate address records; and taking defaulter actions (see *Treatment of tuberculosis: guidelines for national programmes*).

Directly observed treatment is a key part of promoting adherence to treatment. It helps to prevent inconsistent, partial, or incorrect treatment, thereby increasing the likelihood of successful treatment outcome and

reducing the risk of emergence of drug resistance. It involves direct observation of patients taking their drugs every day during the initial phase of treatment. Box 5 provides a checklist for successful promotion of adherence to treatment, as detailed under the following headings:

- **Initial personal communication between the health staff and the patient to explain the treatment of TB.** This should include an explanation of type and colour of drugs prescribed, amount and frequency, possible side-effects, frequency of sputum examination, and consequences of irregular or incomplete treatment.
- **Treatment organized in a way that is convenient and accessible.** Organization of support to ensure adherence to treatment should include organization of directly observed treatment.
- **Treatment observed by anyone who is willing, trained, accountable to the health service, and, importantly, acceptable to the patient.** TB patients should have the option of identifying who is the most convenient TB treatment supporter, e.g. health staff at a health facility (health centre, clinic, hospital) or in the workplace, or a trained and supervised community member.
- **Service and drugs that are free of charge and easily accessible.** Treatment costs, even minimal, can hinder early treatment and affect compliance, thereby increasing the risk of spread of TB. Incentives should be considered, e.g. payment of benefits, salary and hospitalization during treatment.

Box 5. Checklist for successful promotion of adherence to treatment

- Service and medication are offered free of charge and have guaranteed supply.
- Directly observed treatment in the workplace should be in a private room to preserve confidentiality and comfort
- The TB treatment supporter who directly observes treatment must be acceptable to the patient.
- The TB treatment supporter must be well trained and supervised.
- The DOT appointment is organized so as not to disrupt the patient's daily routine.

## 4.4 Common drug side-effects

Anti-TB drugs may cause tears, urine, and semen to turn a pinkish colour. Patients need reassurance that these side-effects are normal. Side-effects that require attention include indigestion, nausea, jaundice, rash, and fever, and should be reported to the health staff by patients. A more detailed account of the side-effects of anti-TB drugs is contained in *Treatment of tuberculosis: guidelines for national programmes*.

## 4.5 Drug supply

Collaboration with the NTP is essential for ensuring correct drug treatment regimens, guaranteeing an uninterrupted drug supply, and assuring drug quality. Many NTPs obtain anti-TB drugs from national and international suppliers (e.g. those listed in Annex 2). Increasingly, however, NTPs are obtaining anti-TB drugs from the Global Drug Facility (see section 5.7 for more details). Countries often buy in bulk and are able to procure at low prices from the world market. A useful source of information for drug prices is the *International Drug Price Indicator Guide* published by Management Sciences for Health. Annex 2 lists the contact addresses.

The NTP will provide anti-TB drugs for small-scale employers who help with case management of small numbers of TB patients. The NTP arrangement for anti-TB drug supply to health providers varies from country to country. In some cases, the NTP may make anti-TB drugs available to health providers at no cost. Large-scale employers who set up a workplace DOTS programme may have a private–public agreement for drug procurement with the NTP.

## 4.6 Recording patients and reporting treatment results

The system of recording and reporting results under the DOTS strategy has three essential components:

- registering all patients with a diagnosis of TB;

- recording their standard treatment outcome;
- reporting of results to the central NTP office.

Employers who contribute to TB case-finding and treatment should collaborate with their local NTP officer to ensure proper record keeping. The most important forms for these employers to know about are the patient identity card (held by the patient) and the TB treatment card (held by the district TB officer).

For large employers who do implement DOTS programmes, collaboration with NTPs is essential in registering TB patients and recording and reporting their treatment results.

The DOTS information management system is essential to ensure that patients are correctly treated and that an adequate quantity of drugs is provided. Effective TB control requires a proper recording and reporting system using standardized definitions and classifications at the beginning and the end of the treatment. Proper record keeping allows early identification and rectification of any problems. The WHO standard reporting system includes the patient identity card, the TB treatment card, a quarterly report on case-finding, and a quarterly report on treatment outcomes:

- **Patient identity card** — This is used for every TB case and belongs to the patient, who keeps it. It records patient identity, diagnostic category, type and form of TB. It also records the selected TB regimen and dose, the date when treatment was started, sputum examination results, TB register number, name of health centre delivering treatment, and date of follow-up appointment. It is often particularly useful when the patient changes residence and therefore health centre.
- **TB treatment card** — This contains essentially the same information as the patient identity card, plus information on the daily monitoring of drug administration in a calendar format. This form is kept at the health centre and is designed to help staff to manage treatment monitoring and to complete the TB treatment register.
- **Quarterly report on case-finding** — This provides epidemiological and administrative information related to logistics (drug supply). It is based on the information entered in the TB treatment register and presents information on the quarterly number of pulmonary smear-positive cases (new and relapse), smear-negative cases, and extrapulmonary cases diagnosed and registered during each calendar quarter.

- **Quarterly report on treatment outcomes** provides the information required in analysing treatment outcomes for new and relapsing TB cases.

The NTP operates two main registers:

- **TB treatment register** — Collaboration with the local NTP officer is essential to ensure that all TB patients diagnosed and treated through the workplace are entered in the local TB register. A TB register is regularly updated with information contained in the patient's TB treatment card. The register is the master source of information for compiling quarterly and annual reports on the numbers of patients diagnosed and their treatment outcomes.
- **Register for TB suspects** — This may be useful for keeping a record of symptomatic patients awaiting sputum or/and X-ray results performed in another facility.

The local NTP officer compiles reports for forwarding to the central NTP office. NTPs worldwide report country results to the World Health Organization, which collates the information at the global level (see *Global tuberculosis control*<sup>\*</sup>).

## 4.7 Special considerations

In a number of settings, the prevalence of TB requires measures beyond those described so far. These include settings with high HIV incidence and high rates of drug resistance, and workplace settings where workers face occupational exposure to TB.

### HIV

Employer health care programmes should include HIV/AIDS activities, especially in countries with high HIV prevalence. Opportunities exist to link HIV and TB activities as part of employer health care programmes.

#### *Ensuring TB control policies incorporate HIV*

Particular emphasis should be placed on patient confidentiality. Concerns among workers regarding confidentiality and judgemental attitudes of health

---

<sup>\*</sup> *Global tuberculosis control: WHO report 2003*. Surveillance, planning, financing. Geneva, World Health Organization, 2003 (document WHO/CDS/TB/2003.316).

personnel appear to be major barriers to accessing care in conventional health care settings. These concerns are likely to be amplified by patients' fears of their status becoming known at work, for example via employer-linked health services. There needs to be a clear statement of policy on the importance of confidentiality, including the consequences of breaking confidentiality when TB/HIV is concerned.

*Ensuring policies on HIV testing and HIV/AIDS care are consistent with national and international guidelines*

Employer health programme policies, which include HIV/AIDS testing and care, must be consistent with national and international guidelines. This is particularly relevant if employers are involved in TB control activities, since it is good practice in countries with high HIV prevalence to offer HIV testing to TB patients. At all times HIV testing should be done only with patient consent and only if confidentiality of results can be assured. In addition, voluntary HIV testing should always include pre- and post-test counselling by trained counsellors. The potential benefits of voluntary counselling and testing include emotional support, ability to plan for the future, protection of sexual partners, and the possibility of both preventive therapy to reduce the incidence of other opportunistic infections during TB treatment and other wellness measures.

*Offering extended TB care for HIV-infected TB patients*

- **Co-trimoxazole** — Use of co-trimoxazole in HIV-positive TB patients has been associated with reduced morbidity and mortality from opportunistic infections, particularly bacterial infections. The relatively low cost of co-trimoxazole makes its use viable for low-resource settings, including workplace clinics. UNAIDS has provided guidelines on the use of co-trimoxazole prophylaxis in HIV infection (available at <http://www.unaids.org>).
- **Isoniazid prophylaxis aimed at decreasing risk of first episode of TB** — Individuals at high risk of progression of latent *M. tuberculosis* infection to TB disease, especially people who are HIV-positive, may benefit from TB-preventive treatment.
- **Isoniazid prophylaxis aimed at decreasing risk of TB recurrence** — Despite successful treatment, TB patients in populations with high TB incidence and high HIV prevalence may be at increased risk of TB recurrence. In settings with very high TB risk, such as gold mines, employer health care provision may include isoniazid prophylaxis, aimed at reducing the risk of TB recurrence in HIV-infected TB patients on completion of TB treatment.



*Ensuring TB education programmes include HIV*

Workplace health education programmes should cover not only TB but also HIV. Specific areas of workplace education requiring attention are the following:

- **Management of stigma** — The workplace is an important venue for promoting behaviour change with regard to the silence and stigma surrounding TB and HIV/AIDS and can play a major role in promoting public acceptance and non-judgemental responses.
- **Training of peer educators** — Training workplace peer educators is a potentially important workplace intervention that can provide education and direct individuals into HIV prevention or care programmes. Continued education of men by peer educators is vital given the control men typically exercise over sexual relationships. Potential peer educators can be recruited for training through post-test clubs or from the general work force.

**MULTIDRUG-RESISTANT TB**

Drug-resistant TB arises where there has been inadequate implementation of the DOTS strategy, with inconsistent, partial, or incorrect treatment of TB. Prompt recognition and effective treatment of drug-resistant TB are necessary to reduce community transmission of drug-resistant strains of bacilli. The management of multidrug-resistant TB (MDR-TB) cases is complicated and requires specialized technical guidance. An international committee (the Green Light Committee, which is hosted by WHO) validates technically sound DOTS-plus projects and provides them with access to preferentially priced second-line anti-TB drugs. The additional resources listed in Annex 2 provide further information on MDR-TB and the Green Light Committee.

**HIGH TB RISK OCCUPATIONS**

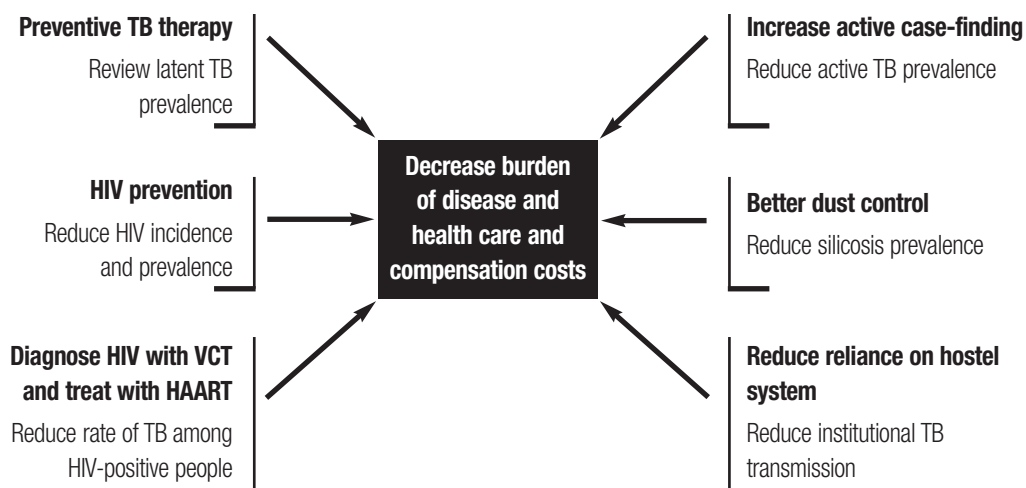
There are a number of sectors in which the work environment and/or type of work result in an increased risk of TB. In some business sectors (e.g. oil and gas, mining, electricity companies, health care, and agricultural plantations) employees may live in cramped quarters and work under poor health conditions. Health care workers may face an increased risk of TB through occupational exposure in hospitals and clinics. This section reviews mining as an example of how TB programmes can be specifically strengthened in the face of an increased occupational risk.

In addition to the associated poverty and cramped working conditions, mining often results in silica exposure and silicosis – all risk factors for TB. Studies have confirmed that exposure to silica dust increases the risk of developing TB, even in the absence of silicosis. Recent studies in South Africa indicate very high and rapidly increasing rates of combined silicosis and TB among miners. A similar study in Poland among coal miners, employees of underground work enterprises and the metallurgical industry, iron workers, and china, ceramics and quarry workers, revealed a significantly raised death rate, due to TB and other infectious diseases, as well as lung cancer. In all cases silicosis was confirmed (relating to their prolonged exposure to dusts containing crystalline silica), as well as other carcinogens specific to their occupation. Thus, TB incidence in mines can be up to 15 times higher than that in the local population. In addition, it is important to note that silico-tuberculosis may be associated with an increased mortality compared with TB alone.

DOTS programmes are particularly important for the mining industry, in view of the high TB risk

Figure 7 shows the range of relevant interventions for the mining industry, in addition to the DOTS strategy. More details on TB management in mines are outlined in depth in the SIMRAC and MOHAC guidelines listed in Annex 2.

Figure 7. Interventions to reduce TB incidence in the mining industry



### Suggestions for further reading

#### TB

*An expanded DOTS framework for effective tuberculosis control.* Geneva, World Health Organization, 2002 (document WHO/CDS/TB/2002.297, available at [http://whqlibdoc.who.int/hq/2002/WHO\\_CDS\\_TB\\_2002.297.pdf](http://whqlibdoc.who.int/hq/2002/WHO_CDS_TB_2002.297.pdf)).

Crofton J, Horne N, Miller F. *Clinical tuberculosis.* London, Macmillan, 1992.

Davies PDO. *Clinical tuberculosis.* London, Chapman & Hall Medical, 1994.

International Union Against tuberculosis and Lung Disease. *Tuberculosis guide for low-income countries*, 4th ed. Frankfurt, pmi Verlagsgruppe, 1996.

*Managing tuberculosis at district level: a training course.* Geneva, World Health Organization, 1992 (document WHO/TB/96.211).

Toman K. *Tuberculosis case-finding and chemotherapy: questions and answers.* Geneva, World Health Organization, 1979 (new edition in press).

Treatment of tuberculosis: guidelines for national programmes. 3rd ed. Geneva, World Health Organization, 2003 (document WHO/CDS/TB/2003.313, available at [http://whqlibdoc.who.int/hq/2003/WHO\\_CDS\\_TB\\_2003.313.pdf](http://whqlibdoc.who.int/hq/2003/WHO_CDS_TB_2003.313.pdf)).

Weyer K et al. *Laboratory services in tuberculosis control.* Geneva, World Health Organization, 1998 (document WHO/TB/98.258, 3 vols).

#### HIV

*HIV/AIDS, sexually transmitted diseases and tuberculosis in prisons: report on a joint WHO/UNAIDS European seminar, Warsaw, Poland, 14–16 December 1997.* Copenhagen, WHO Regional Office for Europe, 1998 (document EUR/ICP/CMDS 08 02 15).

*Prisons and AIDS: UNAIDS technical update.* Geneva, Joint United Nations Programme on HIV/AIDS, 1997 (UNAIDS best practice collection).

*Report on the global HIV/AIDS epidemic.* Geneva, Joint United Nations Programme on HIV/AIDS, 2002.

#### TB/HIV

Harries AD, Maher D. *TB/HIV: a clinical manual.* Geneva, World Health Organization, 1996 (document WHO/TB/96.200).

Preventive therapy against tuberculosis in people living with HIV. *Weekly Epidemiological Record*, 1999, 74:385–398.

*Prisons and AIDS: UNAIDS technical update.* Geneva, Joint United Nations Programme on HIV/AIDS, 1997 (UNAIDS best practice collection).

Treatment regimens in HIV-infected tuberculosis patients. An official statement of the International Union Against Tuberculosis and Lung Disease. *International Journal of Tuberculosis and Lung Disease*, 1998, 2:175–178.

### **Drug-resistant TB**

*Anti-tuberculosis drug resistance in the world: the WHO/IUATLD Global Project on Anti-Tuberculosis Drug Resistance Surveillance. Report 2: Prevalence and trends.* Geneva, World Health Organization, 2000 (document WHO/TB/2000.278).

Crofton J, Chaulet P, Maher D. *Guidelines for the management of drug-resistant tuberculosis.* Geneva, World Health Organization, 1997 (document WHO/TB/96.210 (Rev.1)).

*DOTS-Plus and the Green Light Committee.* Geneva, World Health Organization, 2000 (document WHO/CDS/TB/2000.283).

Espinal M, ed. *Multidrug-resistant tuberculosis. Basis for the development of an evidence-based case-management strategy for MDR-TB within the WHO's DOTS strategy: proceedings of 1998 meetings and protocol recommendations.* Geneva, World Health Organization, 1999 (document WHO/TB/99.260).

Espinal MA, Raviglione M, eds. *Coordination of DOTS-plus pilot projects for the management of MDR-TB: proceedings of a meeting, Geneva, 29 January 1999.* Geneva, World Health Organization, 1999 (document WHO/CDS/CPC/TB/99.262).

*Guidelines for drug susceptibility testing for second-line anti-tuberculosis drugs for DOTS-Plus.* Geneva, World Health Organization, 2001 (document WHO/CDS/TB/2001.288).

*Guidelines for establishing DOTS-plus pilot projects for the management of multidrug-resistant tuberculosis (MDR-TB).* Geneva, World Health Organization, 2000 (document WHO/CDS/TB/2000.278).

### **Occupational health**

Guild R et al., eds. *Handbook of Occupational Health Practice in the South African Mining Industry.* Johannesburg, Safety In Mines Research Advisory Committee, 2001.

*Guidelines for the prevention of tuberculosis in health care facilities in resource-limited settings.* Geneva, World Health Organization, 1999 (document WHO/TB/99.269).



# CHAPTER 5

## Policy development and financing

### 5.1 Establishing a TB policy for the workplace

This chapter outlines the approach to developing a workplace policy for TB and the issues to consider, and provides examples of how policy can be structured and applied.

Workplace policies on TB should be developed to protect fundamental rights, such as non-discrimination, as well as the principles of social justice, freedom, equality, security, and respect for human dignity. In countries where racial discrimination exists, policies should ensure that benefits accrue to all regardless of gender or race. Whether or not TB has a specifically occupational cause, its impact requires management in the workplace. A policy on TB provides the basis for a workplace programme to prevent the spread of infection and to provide treatment and care (see Box 6).

#### Box 6. Benefits of a workplace policy

- A workplace policy:
  - makes an explicit commitment to corporate action;
  - ensures consistency with appropriate national laws;
  - states a standard of behaviour for all employees (whether infected or not);
  - provides guidance to supervisors and managers;
  - enables employees infected with TB to understand what support and care they will receive, so that they are more likely to come forward for appropriate treatment;
  - helps to stop the spread of TB; and
  - assists an enterprise in planning for TB control and, ultimately, saves money.

A workplace policy may be a detailed document specifically devoted to TB or part of a broader agreement on safety, health, and work conditions. It is usually more effective to plan an integrated response to issues affecting the health, well-being, and performance of employees.

The following principles form the basis of a workplace policy:

- **Recognition of TB as a workplace issue** — TB is a workplace issue because it affects the health of workers and the productivity of enterprises. The workplace has a role to play in broader global efforts to limit the spread and effects of TB.
- **Non-discrimination** — In terms of continuing employment relationships or access to health insurance, occupational safety, and health care schemes, no one should experience discrimination on the basis of their TB status. Employees with TB should be entitled to work for as long as they are medically fit and appropriate work is available. Measures to accommodate workers with TB reasonably should be made through flexible leave arrangements, rescheduling of working times, and arrangements for return to work. Workplace programmes should also be gender-sensitive, taking into account women's greater vulnerability to TB and its impact as a result of higher levels of poverty, greater vulnerability to discrimination, and the increasing incidence of HIV among women.
- **Confidentiality** — Job applicants or employees should not be asked to disclose information on the basis of their perceived TB or HIV/AIDS status. Access to personal data should be bound by the rules of confidentiality and according to the ILO code of conduct on the protection of worker's personal data.
- **Healthy work environment** — The work environment should be healthy and safe, as far as practicable, in order to prevent the transmission of TB. This includes the responsibility for employers to provide information and education on TB transmission, appropriate environmental measures, and protective clothing where relevant.
- **Care and support** — Workplaces should provide access to health services that fulfil the needs of male and female employees with TB and related illnesses, or should refer workers to treatment and care services in the community.
- **Social dialogue** — Control and management of TB in the workplace will be more effective if planned and implemented on the basis of collaboration between managers and the workforce. A workplace health and safety committee with broad representation should be responsible for overseeing implementation.

## 5.2 Legal framework for workplace policies

Workplace policies for TB control should be formulated in accordance with national legislation, policy, and practice, taking account of national institutions and organizations in the field. The ministry of labour's health and safety services, the ministry of health, or the NTP should be able to provide this information. What follows is an example of what legislation might cover.

### **TB LEGISLATION FOR THE MINING INDUSTRY IN SOUTH AFRICA**

In South Africa, the mining industry's TB-related responsibilities are heavily regulated. The provisions of the Occupational Diseases in Mines and Works Act (ODMWA) and the Mine Health and Safety Act (MHSA) rule that mine owners and, by delegation, mine medical officers are responsible for ensuring TB surveillance, treatment, and notification in cases of possible chronic lung damage.

- **ODMWA** states that employers are responsible for the reasonable cost of treatment for cardiorespiratory TB, for a 2-year period following diagnosis, in current employees who have worked more than 200 risk shifts. If the employee leaves the company, the state becomes responsible for treatment and costs. Employers are also responsible for providing examinations for compensation purposes (benefit medical examinations) to in-service workers who may be suffering chronic lung damage due to TB.
- **MHSA** specifically requires employers to determine the measures necessary to minimize occupational risk and to control and monitor that risk. Since TB is an occupational risk, the legislation implies that a workplace programme is in place commensurate to the level of risk.

## 5.3 Agreements with contractors and associated companies

A TB workplace programme could also involve subcontractors, suppliers and other associated businesses. Extending the benefits of prevention and care programmes can help to reduce a direct source of infection, create a healthier local community, and help enhance the company's reputation for corporate social responsibility. However, adherence to a workplace TB policy by contractors may prove difficult.



Education and prevention materials should be shared with contractors and associated companies, together with policy documents. It may be practicable to give smaller contractors access to occupational medical services, where these exist. Some companies may decide to build a compliance clause into contracts with suppliers or subcontractors.

## **5.4 Role of worker representatives and organizations**

Cooperation between management and workers or their representatives is an essential element of the organizational measures that need to be taken in order to control and prevent TB in the workplace. Employee participation has been identified as a major determinant of successful prevention and management of a number of diseases and health problems in the workplace.

Key areas for collaboration include:

- measures to combat the fear and discrimination that surrounds TB;
- development of an appropriate TB policy, creating an atmosphere of trust to facilitate its introduction, and supporting implementation;
- design of the benefits and compensation structure, which needs to be both cost-effective and adequate for the needs of employees.

## **5.5 Using external resources to improve the quality of TB control activities**

### **SYNERGIES WITH THE LOCAL INFRASTRUCTURE**

Efforts should be made to ensure information exchange and collaboration between the workplace health infrastructure and the local NTP and, in some cases, nongovernmental organizations (NGOs). Businesses can reach an agreement with the local NTP to share delivery of care. For example, smaller companies can use the NTP laboratory services and drugs while providing DOT, social support, and counselling at the workplace; neighbouring companies can pool resources to develop a common programme.

## SUBCONTRACTING OF SERVICES

The quality of TB services – whether provided internally or outsourced – is crucial. Examples of services that could be subcontracted include sputum microscopy laboratory services or X-ray screening services. External accredited collective services, such as training, monitoring and evaluation services, may also be used. Box 7 sets out the main considerations to bear in mind.

### Box 7. Evaluating which services to outsource

#### Service suitable to outsource if:

- it is not a company core competency
- company is not staffed to run it
- it is too costly to set up in-house
- it is widely available on the open market
- quality of service available on the open market is good

#### Service not suitable to outsource if:

- it is already a core competency in the company
- it leverages existing skills and facilities in the workplace
- it is more cost-effective to sustain in-house

- it is not available on the open market
- quality of open market is not high enough

#### Service suitable to outsource:

- laboratory testing for sputum microscopy
- drug storage and shipping
- X-rays for active case-finding

#### Typically not suitable for outsourcing:

- drug demand management
- case-finding – especially when it depends on self-presentation
- direct observation of treatment

## 5.6 Employer TB programmes using franchise or accreditation schemes

When a large enterprise wishes to implement a workplace DOTS programme, this usually involves operating under a franchise or accreditation scheme with the NTP. Employers should contact the NTP to negotiate implementation of the DOTS strategy, for example through a memorandum of understanding (see example in Annex 1).

## 5.7 Sources of technical guidance and funding support

Technical and funding support are available at both the national and international level. Useful sources of information include the Stop TB Partnership Secretariat and the World Health Organization. Both have directories of resources at the country level and can help to identify technical experts to assist with specific issues.

### GLOBAL FUND

Following a call for action by United Nations Secretary-General Kofi Annan, the Global Fund to Fight AIDS, Tuberculosis and Malaria was established to bring critical funding to countries battling against these three diseases. It is designed to attract, manage, and disburse additional resources through a new public-private partnership. Information on how to submit proposals through the Country Coordinating Mechanism is available at: <http://www.globalfundatm.org/proposals.html>.

### GLOBAL DRUG FACILITY

The Global Drug Facility focuses on guaranteeing uninterrupted global supplies of quality drugs, catalysing rapid treatment expansion, and stimulating political and popular support in countries throughout the world for public funding of appropriate drug supplies, and securing sustainable disease control (see Annex 2).

### GREEN LIGHT COMMITTEE

The Green Light Committee focuses only on technical and drug supply support for the management of multidrug-resistant TB (see section 4.7).

### Suggestions for further reading

Non-discrimination is a fundamental principle of the ILO and is protected through a number of conventions and codes, including the Convention on Non-discrimination in Employment and Occupation (No. 111) (1948), and most recently the ILO Code of Practice on HIV/AIDS and the World of Work (2001). Other relevant ILO Conventions are the Convention on Occupational Safety and Health Convention (No. 155) (1981) and Occupational Health Services Convention (No. 161) (1985).

# CHAPTER 6

## TB activities in the workplace and the community

### 6.1 Extending services to employees' dependants

Where possible, workplace programmes should be extended to include workers' families; this will make the programme more effective and enable sharing of its benefits with the wider community. Programme support may vary from full access to services provided at no-cost, to reduced cost services under certain conditions. The following issues and policy options should be considered:

- **Presentation to the workplace TB clinic by family members** — Employee's families may be reluctant to present for diagnosis, but should be encouraged to do so through information and education measures, and the promotion of strict confidentiality.
- **Opting in and out of voluntary workplace schemes** — Making voluntary contributions to health insurance schemes for family members should be an option for employees at any point in their employment with the company.
- **Definition of family to be covered under workplace scheme** — Policies should make clear which family members/dependants are covered, to help with planning and budgeting, and to ensure transparency.
- **Extent of coverage for the family** — If it is not possible to offer family members the full range of TB services available at the workplace, it is recommended that the company try to make special arrangements with local government clinics. Cost-sharing measures and other forms of public-private partnering should be explored.

## 6.2 Extending services to the wider community

Tuberculosis is a public health priority and of concern to the community as a whole, not just to the TB patient and his or her immediate contacts. The workplace is, of course, part of the community – so the health of each will impact positively or negatively on the other. Activities can be carried out in collaboration with local authorities, community associations, NGOs, and donor agencies.

One of the indirect benefits of expanding corporate commitment into the community is building local public sector capacity. If done well, this can become a viable exit strategy from a long-term commitment to workplace TB programmes. The following case study from Chevron Texaco provides an example of how extending services to the community can benefit both the company and the community.

### CASE STUDY 3

#### WORKPLACE TB CONTROL EXPANSION TO THE COMMUNITY: THE CHEVRON TEXACO PROGRAMME

---

##### **Company background**

Chevron Texaco is the world's second largest integrated oil and gas company, engaged in oil exploration, production, refining, supply, transportation, and marketing globally, with operations in nearly 180 countries and territories. In 2001, the company directly employed more than 55 000 employees worldwide, with 2700 employees in Angola. Chevron Texaco Angola also employs between 3000 and 5000 contractors.

##### **Chevron Texaco Angola TB status**

WHO estimates TB incidence in Angola to be 274 cases per 100 000. The local hospital in the Cabinda region treats 170 cases per 100 000. This incidence is lower than the normal national average, in part because it is assumed that many local cases are currently undiagnosed. In addition, MDR-TB in the community is on the rise, presenting a threat for Chevron Texaco's employees and business.

### **Why a community programme and its evolution**

In 2000, Chevron Texaco decided to form a partnership with local government to operate a community TB programme. This was because many of its employees lived and interacted with people in the community, and would therefore be vulnerable to TB infection if the community burden were not managed. Government programmes were overstretched, and Chevron Texaco was able to supplement services with existing testing and diagnostic equipment and expertise. Since these were existing resources, the benefits to lowering the community risk exceeded the cost to extending TB services to the community. The company realized that by strengthening the government programme, they would over time be able to withdraw their effort as the government contributed increasingly to sustaining TB activities. Overall the programme timings were:

#### *Expansion to the community*

Chevron Texaco trained government staff and provided funding to upgrade government facilities. Government capability and capacity were increased.

Chevron Texaco broadened their support in the area, focusing on monitoring. They provided targeted support to the government run TB programme in their community.

#### *Community programme key elements*

The Chevron Texaco programme is innovative in terms of collaboration with the government programme. In particular:

Detection programmes rely mainly on “passive” case-detection, but generate good self-presentation rates through a strong community involvement that includes religious leaders and traditional healers.

Chevron Texaco is working to train traditional healers, community leaders, and nurses, in order to develop sustainable medical capacity for the treatment of TB.

### **Programme results 2001**

- Of 555 active cases in the region, 37% are still undergoing treatment.
- Of the remaining 63%, 92% completed treatment or were confirmed cured, 4% defaulted, 3% died, and 1% failed treatment.
- Case detection is expected to have risen; the results will be available by mid-2003.

*This case study is a Summary of the World Economic Forum Global Health Initiative Case Study on Chevron Texaco's TB programme available at: <http://www.weforum.org/globalhealth/cases>.*

## 6.3 Education and training

It is recommended that cross-sections of staff (in larger companies) be trained to recognize TB and to promote TB awareness. These staff may include, but need not be limited to, the human resources department and medical services. The goals of a workplace education programme should be to:

- raise awareness of TB and the fact that it can be cured;
- reduce the stigma associated with TB so that workers can seek medical treatment early on without fear of dismissal or other negative reprisals;
- increase case-finding via self-presentation followed by early and timely intervention.

The education programme should select certain employees to act as internal company advocates for TB as well as to help with implementation of the TB control programme. Trained workers can help in:

- determining the needs of the workplace;
- developing and monitoring a workplace TB prevention programme;
- passing information on to co-workers, clients, families and other relevant individuals;
- performing directly observed treatment duties.

TB education and prevention programmes are more effective when workers are actively engaged in the process; group work, role-play and case studies can help illustrate points and involve participants. In workplaces that employ large numbers of workers, a train-the-trainer programme could be developed and peer educators used.

### COMPONENTS OF A TB EDUCATION PROGRAMME

It is important to create a supportive and informed environment to maximize the impact of behavioural and biomedical interventions at workplaces. Although TB education programmes should be tailored to reflect the different needs and priorities of the company and the work environment, there are some essential elements a TB education programme should include. These are:

- **Transmission of disease** — Make clear the nature of transmission and the difference between TB infection and disease, and provide guidance on how to minimize the risk of transmission to oneself and to others.

- **Treatment of TB** — Emphasize two key points – that TB can be cured and people should not be ashamed to seek treatment, and that basic procedures have to be observed when taking medication in order to ensure complete cure and avoid the risk of drug-resistant TB. As far as compliance is concerned, it should be addressed by education to ensure that workers understand the need to complete drug therapy. Workplaces that provide *directly observed treatment* should stress the importance of these programmes.

- **Overcoming stigma** — The myths and shame surrounding TB should be dispelled, workers' rights promoted, and confidentiality respected – this is essential to successful prevention and cure.

Some additional elements need to be considered in the case of a joint HIV/TB education programme, including addressing attitudes and norms relating to sexuality, power imbalance in gender relations, and risky behaviour and promoting behaviour change (see *Implementing the ILO Code of Practice on HIV/AIDS and the world of work*<sup>\*</sup>).

## 6.4 Promoting World TB Day activities

World TB Day is held each year on 24 March. It can play a crucial role in increasing the awareness of various stakeholders about the symptoms, diagnosis, and treatment of TB, and the importance of effective TB control. It also has the potential to significantly increase case detection rates through education, awareness-building and social mobilization. World TB Day was celebrated in more than 60 countries last year and the national organizers are open to the inclusion of local businesses in their activities. The Stop TB Partnership Secretariat in Geneva, Switzerland, can also provide materials and ideas for events. Those interested in promoting World TB Day in their workplace should contact the local NTP manager and/or the Stop TB Partnership Secretariat (for contact details see Annex 2).

---

<sup>\*</sup> *Implementing the ILO Code of Practice on HIV/AIDS and the world of work: an education and training manual.* Geneva, International Labour Organization, 2002.



**Suggestions for further reading**

Achmat Z, Cameron E. Workplace discrimination: helping the spread of HIV. *South African Labour Bulletin*, 1995, 19:8–19.

London L. AIDS control and the workplace: the role of occupational health services in South Africa. *International Journal of Health Services*, 1998, 28:575–591.

Nagin D et al. Control of tuberculosis in the workplace: engineering controls. *Occupational Medicine*, 1994, 9:609–630.

Starzynski Z et al. Mortality among different occupational groups of workers with pneumoconiosis: results from a register-based cohort study. *American Journal of Industrial Medicine*, 1996, 30:718–725.

Williams B, Campbell C. Responses to HIV/AIDS in the mining industry: past experience and future challenges. In: Williams BG, Campbell CM, MacPhail C, eds. *Managing HIV/AIDS in South Africa: lessons from industrial settings*. Auckland Park, Council for Scientific and Industrial Research, 1999:13–29.

## Annex 1 — Sample tools to help implement DOTS in the workplace

### SAMPLE OF MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN THE NTP AND AN EMPLOYER

#### 1. PARTIES

The National TB Programme of

..... [Country/District Name] and the employer  
 ..... [Name of Employer], hereinafter referred to  
 as “designated agency”, agree to cooperate in the implementation of  
 tuberculosis (TB) control activities to the population of .....  
 [geographical area] with an employee population of approximately  
 ..... [insert size of workforce to be covered by programme]  
 and a community population of ..... [insert total population  
 and geographical area].

The NTP aims to improve cure rates among tuberculosis (TB) patients to more than 85%. To make the programme more effective, wider participation of local employers, and through them communities, in TB control is required.

The designated agency is an organization of ..... [insert one sentence about organization’s involvement in health].

#### 2. PERIOD OF COOPERATION

The period of cooperation shall be [number] years, commencing the first day of ..... [month] of ..... [year] until the last day of [month] of ..... [year].

#### 3. OBJECTIVES

The objectives of this MoU are:

- (i) To identify and establish the roles and responsibilities of the partners in the organizations and the delivery of TB care as per the guidelines to population referred to in clause 1.
- (ii) To provide diagnosis and treatment services for TB control following the NTP strategy and thereby establish a 70% case detection rate and an 85% cure rate.
- (iii) To develop the capacity of health care workers to diagnose and treat TB and implement the NTP.

#### 4. TERMS, CONDITIONS, AND SPECIFIC SERVICES DURING THE PERIOD OF THE MOU

##### **A. The funding agency shall:**

- (i) Provide start-up and recurring costs to the designated implementing agency as detailed in this memorandum.
- (ii) Provide anti-TB drugs free of charge to the designated agency for the period of this agreement. The quantity of drugs provided will be sufficient to treat patients as reported in quarterly reports and confirmed in the TB Register through patient interviews.
- (iii) Provide all TB and Laboratory Registers as well as reagents for patients undergoing sputum examinations.
- (iv) Provide overall monitoring and quality assurance, including periodic site inspection visits, cross-checking of Laboratory Registers and TB Registers.
- (v) Provide technical guidelines and updates (manuals, circulars, etc.) from the NTP to the designated agency and review any educational materials that are developed.
- (vi) Provide technical training for the TB supervisors.

##### **B. The designated agency shall:**

###### *Policy*

- (i) Assume responsibility for executing this project in the target areas specified in Clause 1 following NTP policy.
- (ii) Provide appropriate TB services according to NTP policy during the term of this agreement.

###### *Diagnosis*

- (iii) Provide health education to employees and community.
  - a. Generate health education and awareness in the community through, for example meetings, discussion, posters, videos, slide shows, and home visits ..... [insert appropriate list of activities].
  - b. Use local community fora to prepare and disseminate literature and training materials.
  - c. Inform the community about the dangers of TB signs and symptoms, diagnosis and treatment facilities, and prevention of TB through different local community forums. As appropriate, cured patients may also play an important role in the identification and motivation of symptomatic persons for sputum examination and in ensuring that they take regular treatment. These people may also be mobilized as health educators and DOT providers.

d. All microscopy/treatment centres shall have the following messages prominently displayed in the local language(s):

- diagnosis and treatment of TB are free of charge,
- all persons with cough for 3 weeks or more should to be tested for TB,
- TB is a curable disease.

(iv) Provide one or more medical officers, at the designated agency's expense, for diagnosis and treatment of TB in sites as deemed appropriate.

(v) Perform acid-fast bacilli (AFB) microscopy and maintain the Laboratory Register as per the NTP, ensuring that every patient whose sputum is examined is recorded in the TB Laboratory Register. Perform laboratory quality control as required. Do not charge patients for AFB microscopy. Arrange for feedback of results of sputum examinations to public-private providers who referred the symptomatic patients.

#### *Treatment, including direct observation of therapy*

(vi) Provide anti-TB treatment as per the NTP policy

(vii) Develop a system for direct observation and follow-up and return to treatment of non-adherent patients (“defaulters”) according to the NTP policy. Patients who miss a dose of treatment during the intensive phase are to be visited in their homes within one day of the missed dose, and, during the continuation phase, within one week of the missed dose.

#### *Drug supply*

(viii) The NTP will maintain and distribute to the employer adequate inventories of drugs and consumables for smooth operation of the employee programme. The employer will not charge employees or community members who reside within the agreed district for anti-TB medications given.

#### *Monitoring and supervision*

(ix) The employer will maintain a TB Register for the area and ensure that all patients who begin treatment and reside within the designated district are registered in the TB Register of the NTP.

(x) The NTP will provide training for the employer TB programme workers according to the NTP policy.

(xi) The employer will prepare and submit monthly and quarterly reports (New and re-treatment cases, Sputum conversion, Results of treatment, Programme management and logistics) according to NTP guidelines.

### ***C. Grant-in-aid***

The available budget to be released by the District TB Control Officer to the employer on a yearly basis. The table provides a guide to developing the budget.

#### *Start-up activities (one-time only)*

<b>Item</b>	<b>Amount</b>
Civil works for upgrading of microscopy centres	
Funds for training of multi-purpose workers and other staff	
Funds for training of multi-purpose supervisors and related staff	
Subtotal available for one-time assistance	

#### *Annual grant-in-aid*

<b>Item</b>	<b>Amount</b>
Personnel (NGO to ensure full-time, mobile staff)	
Honoraria to TB treatment supporters for directly observed treatment	
General support (to cover all administrative and technical costs of running the programme, including ensuring the presence of a Medical Officer of the TB unit, book-keeping, having the account audited annually by a chartered accountant, POL and maintenance, phone calls, sending of facsimiles, photocopies, accounting expenses, etc.)	
Amount available for assistance	

## **5. PENALTIES/GUARANTEES**

(i) Either party shall have the right to terminate the understanding at any time with 30 days' notice, indicating in writing reasons for the same to the other party. In-kind goods must be returned at the point of termination of this agreement.

(ii) If the other party wishes to continue the contract, it must respond in writing within 30 days of receipt of the termination notice.

(iii) If a resolution between the two parties is not possible, then the National/State TB Officer shall attempt to resolve the dispute. A final decision

on this matter will be made, if necessary, by the State Director of Health Services or his/her designee.

(iv) Failure to implement the project as agreed upon may lead to termination of this agreement.

#### **6. PROGRAMME MONITORING**

If the proportion of sputum smear-positive patients is less than half of pulmonary cases put on treatment, or the sputum conversion rate at 3 months for new smear-positive patients is less than 85%, intensive supervision and evaluation will be done collaboratively.

#### **7.DURATION AND RENEWAL**

This MOU shall be valid from the first day of ..... [month/year] to the last day of ..... [month/year], unless terminated sooner by either of the parties hereto. The parties shall meet after the evaluation conducted at the end of the sixth month in order to discuss renewal of this agreement.

---

Signature DTO

---

Signature employer official

## Sample TB treatment register

Date of registration	District TB No.	Name (in full)	Sex M/F	Age	Address (in full)	Name treatment unit	Date start treatment and regimen*	Date classification P/EP	Type of patient**								
									New (N)	Relapse (R)	Transfer in (T)	Treatment after default (D)	Other (O)				

\* Enter regimen

\*\* Enter the appropriate code: N: new case – patient who has never had treatment for tuberculosis or has taken tuberculosis drugs for less than 1 month

R: relapse – patient previously treated for tuberculosis and considered cured, but is now smear-positive

T: transfer in – patient who has transferred into the district from another district

D: treatment after default – smear-negative patient who is starting treatment again after defaulting

O: other – situations different from the 4 mentioned above

## Annex 2 — Additional resources available on request

### Management of TB in high-risk environments

Bone A et al. *Tuberculosis control in prisons: a manual for programme managers*. Geneva, World Health Organization, 2000 (document WHO/CDS/TB/2000.281).

Safety In Mines Research Advisory Committee. *Guidelines for TB management in mines in South Africa* (available through the World Economic Forum – see Annex 2 for address.)

### Management of TB/HIV

*Strategic framework to decrease the burden of TB/HIV*. Geneva, World Health Organization, 2002 (document WHO/CDS/TB/2002.296).

### Management of TB and TB/HIV: workplace case studies

*De Young Petal. Partnering with the community, the local government and Stop TB to establish DOTS treatment in the Cabinda province. Angola, Chevron Texaco, 2002. (World Economic Forum/Global Health initiative).*

*Developing an enhanced tuberculosis (TB) programme before TB becomes a significant business risk*. South Africa, DeBeers, 2002.

*Detecting active tuberculosis (TB) cases, with 88% of cases being cured or completing treatment, for less than US\$ 85 per employee per year*. South Africa, AngloGold, 2002.

### Technical microscopy and culture manuals

Enarson D et al. *Tuberculosis guide for low-income countries*. Paris, International Union Against Tuberculosis and Lung Disease, 1998.

Weyer K et al. *Laboratory services in tuberculosis control*. Geneva, World Health Organization, 1998 (document WHO/TB/98.258, 3 vols).



**Requests for publications**

- *For a recent copy of the UNICEF Essential Drugs Price List, write to:*

UNICEF, UNICEF PLADS  
Freeport, DK-2100  
Copenhagen, Denmark  
Fax: (45) 269421

- *For the International Drug Price Indicator Guide, write to:*

Management Sciences for Health  
Drug Management Programme  
1655 North Fort Myer Drive, Suite 920  
Arlington, VA 22209, USA

- *For ILO publications, write to:*

ILO Publications Bureau  
ILO Publications, Rights  
and Permissions Section  
4 route des Morillons  
Geneva 22, Switzerland  
Tel: +41 22 799 6111  
Fax: +41 22 798 8685  
E-mail: pubvente@ilo.org

Internet:

<http://www.ilo.org/public/english/180publn/index.htm>

- *For Stop TB partnership publications, write to:*

Stop TB, World Health Organization  
20 avenue Appia  
1211 Geneva 27, Switzerland  
E-mail: stoptb@who.int  
Internet: [www.stoptb.org](http://www.stoptb.org)

- *For World Economic Forum publications:*

World Economic Forum  
The Global Health Initiative  
91-93 route de la Capite,  
1223 Cologny, Switzerland  
E-mail: [globalhealth@weforum.org](mailto:globalhealth@weforum.org)  
<http://www.weforum.org/globalhealth>

- *Other useful addresses*

International Committee  
of the Red Cross  
Health and Relief Division  
International Committee  
of the Red Cross  
19 avenue de la Paix  
1202 Geneva, Switzerland  
Tel: +41 22 734 6001  
Fax: +41 22 733 2057

- *Offices of the World Health Organization*

World Health Organization  
20 avenue Appia  
1211 Geneva 27, Switzerland  
Tel: +41 22 791 2111  
Fax: +41 22 791 0746

WHO Regional Office for the  
Americas/Pan American Sanitary Bureau  
525 23rd Street NW  
Washington, DC 20037, USA  
Tel: +1 202 861 3200  
Fax: +1 202 223 5971

WHO Regional Office for Africa  
Medical School, C Ward  
Parienyatwa Hospital  
Mazoe Street, PO Box BE 773  
Belvedere, Harare, Zimbabwe  
Tel: +263 4 705619  
Fax: +263 4 791214

WHO Regional Office for  
the Eastern Mediterranean  
P.O. Box 1517  
Alexandria 21511, Egypt  
Tel: +203 482 0223  
Fax: +203 483 8916

WHO Regional Office for Europe  
8 Scherfigsvej  
2100 Copenhagen o, Denmark  
Tel: +45 39 171717  
Fax: +45 39 171818

WHO Regional Office for South-East Asia  
World Health House  
Indraprastha Estate  
Mahatma Gandhi Road  
New Delhi-110002, India  
Tel: +91 11 331 7804  
Fax: +91 11 331 8607

WHO Regional Office  
for the Western Pacific  
PO Box 2932  
Manila 1099, Philippines  
Tel: +632 522 9800  
Fax: +632 521 1036

• *Suppliers of anti-tuberculosis drugs*

Action Medeor  
Deutschesmedikamenten-Hilfswerk  
St Töniser Strasse 21  
4154 Toenisevöirst 2, Germany  
Fax: +49 21 56 80632

International Dispensary Association  
(IDA)  
P.O. Box 37098  
1030 AB Amsterdam, Netherlands  
Fax: +31 20 4031854

Echo International Health Services Ltd  
Ullswater Crescent  
Coulsdon  
Surrey CR5 2HR, England  
Fax: +44181 6680751

The Medical Export Group  
P.O. Box 598  
4200 AN Gorinchem, Netherlands  
Fax: +31 18 3634650

International Association for  
Procurement and Supply  
Rode Kruisstraat 20  
P.O. Box 37 030  
1030 AA Amsterdam, Netherlands  
Fax: +31 20 6343401

KCR International  
45 rue de la Libération  
78350 Jouy-en-Josas, France  
Fax: +33 139 565355

Orbi-Pharma  
Van Trierstraat 40  
2018 Antwerp, Belgium  
Fax: +32 3 2169897

• *International Labour Organization:  
Headquarters and Regional Offices*

International Labour Organization,  
Headquarters  
4 route des Morillons  
1211 Geneva 22, Switzerland  
Tel: +41 22 799 6111  
Fax: +41 22 798 8685  
E-mail: ilo@ilo.org

ILO Regional Office for Europe  
4 route des Morillons  
1211 Geneva 22, Switzerland  
Tel: +41 22 799 6111  
Fax: +41 22 798 8685  
E-mail: europe@ilo.org

ILO Regional Office for Africa  
(Immeuble du Bureau régional  
de l'OIT pour l'Afrique)  
Boulevard Lagunaire Commune  
du Plateau, B.P. 3960, Abidjan 01  
Côte d'Ivoire  
Tel: +225 212639  
Fax: +225 212880  
E-mail: abidjan@ilo.org

ILO Regional Office for Asia  
and the Pacific (ROAP)  
P.O. Box 2-349  
UN Building, Rajdammen Avenue  
Bangkok 10200, Thailand  
Tel: +66 2 288 1234  
Fax: +66 2 281 1496  
E-mail: bangkok@ilo.org

ILO Regional Office for Arab States  
P.O. Box 11-4088  
John Kennedy Street  
Mimosa Building, 12th Floor  
Beirut, Lebanon  
Tel: +96 11 371576  
Fax: +96 11 371573  
E-mail: [beirut@ilo.org](mailto:beirut@ilo.org)

ILO Regional Office for Latin America  
and the Caribbean  
Apartado Postal 3638  
Las Flores 295, San Isidro  
Lima, Peru  
Tel: +51 1 221 5286  
Fax: +51 1 421 5292  
E-mail: [lima@ilo.org](mailto:lima@ilo.org)



