Managing tuberculosis

A guide for managers and supervisors in the oil and gas industry
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Introduction

The purpose of this guide is to help managers and supervisors at all levels in the oil and gas industry to be aware of the threat of tuberculosis (TB), and to help them mitigate the impact of TB on their companies’ projects and operations.

Scope

This guide provides a general overview of the following key aspects relating to TB management:
1. The importance of effective TB management.
2. Relevance to oil and gas facilities.
4. Workplace programmes for TB management.

The importance of effective TB management

Untreated, tuberculosis can lead to death; indeed, TB is the leading cause of death from a curable infectious disease. In 2008, there were 9.4 million new TB cases and an estimated 1.3 million deaths¹.

TB can disrupt workflow, reduce productivity, increase health-care costs and result in the need to train new workers. The majority of TB cases occur in people between the ages of 15 and 54; hence it is the core of the working population that is most vulnerable.

The impact of TB on business is severe. Each year, TB is responsible for a reduction of around US$16 billion in the annual incomes of the world’s poorest communities². It is therefore essential for business to address the threat of TB, and act collectively to ensure the most effective and cost-efficient response. To this end, a number of roundtables, conferences and forums are held around the world every year to ensure that this approach is adopted by interested parties.

The emergence of HIV in the past quarter century has proved a challenge to global efforts to reduce the prevalence of TB. HIV is a strong risk factor for the development of TB, and as a result, TB has emerged as the most common HIV-associated opportunistic infection worldwide³. The most recent data can be obtained from the World Health Organization (WHO)⁴.

Effective control of the disease in countries with a high incidence of TB will have a positive impact on the global situation, and will minimize the health consequences and cost burden to business, local governments and communities.

¹ www.who.int/mediacentre/factsheets/fs104/en/index.html
² World Economic Forum
³ Lawn, S. D. Medicine Vol 37:12, 2009
⁴ www.who.int/tb/en
Relevance to oil and gas facilities

The oil and gas industry is particularly vulnerable to the impact of TB, due to the fact that many countries in which the industry operates are ‘high-burden’ countries (i.e. they have high TB prevalence rates) and there is considerable movement of industry workers between regions. Appendix 1 lists the estimated global incidence, prevalence and mortality of TB in 2008.

Whilst operations in any country can be impacted by TB, 90% of cases occur in developing countries. It is most often the case that those states worst affected suffer from the combined effects of economic decline, the breakdown of health systems, insufficient application of TB control measures, the spread of HIV/AIDS and the emergence of multi-drug resistant TB.

Many industry employees live in close quarters (e.g. on camps or offshore platforms), and this can facilitate the spread of the disease. As described later in this guide, TB is spread primarily by close, regular contact between individuals. For example, sharing dormitory and dining facilities exacerbates the degree of risk and this can exceed that presented by a regular work environment.

Employees in the oil and gas industry frequently move between high-burden and low-burden countries and vice versa. Through this movement, workers from low prevalence countries are at risk when travelling to regions with high levels of TB, however the reverse can also be true due to reactivation of latent infection.

Clinical aspects of tuberculosis, including detection and treatment

TB is a treatable infectious disease caused by the bacterium Mycobacterium tuberculosis. There are two forms of this bacterium that can cause disease in humans—human and bovine. The human form is usually transmitted from person to person by droplets from the throat and lungs of people with active respiratory disease. The bovine form can be acquired from drinking milk from infected cattle and also from bush meat. This form is very rare in countries where milk is routinely pasteurized and effective bovine TB eradication programmes are in place. Disease affecting the lungs (pulmonary TB) is the most common form, but TB can affect other organs, for example the central nervous, gastro-intestinal and lymphatic systems, and bones and joints.

After inhalation of infected droplets, the organism passes to the lungs and may spread via the lymphatic system to the lymph nodes. The bacteria may be destroyed by the body’s immune system but, in many cases, it can survive and spread via the lymphatic system or bloodstream to other parts of the body where it can lie dormant for many years (latent TB).
Ten per cent of people with latent TB will develop clinical disease in their lifetime; the proportion increases if people are immunosuppressed (e.g. due to co-infection with HIV). Ten per cent of people with latent TB and untreated HIV develop clinical TB each year.

Common presentations of TB include persistent cough, fever, and unexplained weight loss. Less commonly, fatigue, chest pain and night sweats may occur; if any of these symptoms are present staff supervisors should be alerted to the need for further investigation.

Since TB is a worldwide public health problem, almost all countries have a National TB Programme (NTP). The NTP is usually charged with coordinating all TB control activities, including education and prevention, procurement of drugs and supplies, and reporting of country-level TB data to the WHO. The NTP and its provincial/local TB counterparts are important partners in TB efforts. Any coordinated efforts to prevent TB among the working population in the oil and gas industry should be developed in conjunction with the host country’s national programme.

Most commonly TB affects population segments with low levels of education and socio-economic development. Those affected can be stigmatized, particularly in today’s world where TB is linked to immunodeficiency diseases such as HIV. Complicating this stigma is the fact that those infected realize that they may lose their jobs if discovered, and may attempt to conceal or minimize their symptoms.

Evaluation of employees with symptoms must be undertaken by a competent physician who would normally take a medical history, perform an examination, and arrange diagnostic tests, for example a chest X-ray and sputum examination. Latent (i.e. symptomless) infection may be detected by skin and/or blood testing; the latter is becoming more sensitive and useful.

It is possible to screen high-risk groups for active TB; reference should be made to Appendix 2.

Intensive treatment of active TB lasts, on average, for six months, however approximately 90% of the mycobacteria are killed within the first week, and patients may be permitted to be in contact with other people after two weeks, provided they remain on their treatment. This means that employees can return to work if they are physically fit to do so. Some countries, including the USA, give people found to have latent TB six months anti-tuberculous treatment, but this is not a universal practice worldwide.

Many national TB programmes have adopted the WHO recommendation of observing patients swallowing every dosage of their TB treatment (known as DOT—Directly Observed Therapy).

Multi-drug resistant TB has become a global problem related to inadequate or inappropriate treatment and non-completion of the course.

It is essential that patients on treatment undergo clinical evaluation and laboratory testing on a monthly basis, to evaluate possible adverse reactions of anti-TB medication, and to assess adherence to the treatment schedule.

The management of HIV-related and multi-drug resistant TB is more complicated and requires expert supervision. In some countries latent TB, once detected, is treated to reduce the likelihood of developing active TB in the future.
Workplace programmes for TB management

Any workplace programme should take into consideration the level of disease burden in the country in which it is being implemented, the national tuberculosis programme and the local health infrastructure. In 2003, the WHO and the International Labour Organization (ILO) issued joint guidelines for Workplace TB Control Activities. These guidelines outlined the basic principles of workplace policy on TB and are given in Appendix 3. It is important that the workplace TB policy provides, at a minimum, a written overview of company activities and commitment to the issue.

Workplace programmes should not, and cannot, operate in isolation. It is important that companies partner with national TB and HIV programmes, and relevant NGOs where appropriate.

TB in the community has a direct effect on infection rates in the workforce; hence, supporting TB control efforts in the community will have a positive impact on TB incidence in the workforce. Preventive programmes should be aimed at preventing transmission and acquisition of TB, and avoiding activation of latent TB.

Regardless of which strategy or strategies are adopted, it is important to ensure that all of the necessary components are included, and that the approach is tailored to the needs and culture of the specific project, activity or location. Monitoring and evaluation of a TB management programme (e.g. as part of a management systems approach) is key to ensuring that the programme meets its goals and objectives. The following sections address components that could form part of a workplace TB management programme.

Living conditions

Operations in the oil and gas industry often require workers to stay in camps and/or on offshore platforms. Consequently, the potential for transmission among co-workers increases substantially. Avoiding overcrowding and establishing minimum space requirements per bed is an essential step towards mitigating the spread of TB.

It is therefore important to ensure that:
- adequate living space is provided within accommodation areas;
- adequate distance is maintained between accommodation buildings;
- appropriate ventilation and air filtration is provided in living and sleeping areas; and
- the necessary housekeeping is carried out to ensure good hygiene conditions.

These steps will help to prevent the spread, not only of TB, but of other diseases (e.g. meningitis) as well.

Nutrition

Good nutrition and proper caloric intake help the body to build a strong immune (defence) system.
Inadequate provision of high-quality food is likely to encourage the development of TB as well as other diseases. Oil and gas facilities providing food should ensure that all milk and dairy products come from a safe source, to avoid any possibility of bovine TB infection.

**Behaviour and lifestyle**

Smoking, high alcohol consumption or drug abuse can significantly reduce the effectiveness of the body’s defence system. Additionally, spitting and a failure to capture coughs and sneezes and properly dispose of tissues, etc. can increase the spread of TB.

**Screening programmes**

Companies operating in environments conducive to the spread of TB should consider the introduction of an effective TB screening programme. If infected with active TB, a single visitor to a platform or remote camp can potentially lead to many more employees becoming infected, causing substantial disruption. An appropriate risk-based screening programme therefore needs to be applied and managed by a health professional.

**Immunization**

Bacille Calmette Guerin (BCG) is the longest established vaccine against tuberculosis. It was first used in 1921 and is still used in many countries today. It is more effective in protecting newborn children from the disease than older children and adults.

**Education**

Education is the key to understanding TB. Core components of TB education include:

- raising awareness of the signs and symptoms of TB, including an emphasis on the fact that TB can be cured;
- providing information on resources for TB diagnosis and treatment; and
- raising awareness of the importance of adhering to the recommended treatment regime.

**Case notification**

In most countries there is a requirement for cases of TB to be reported to national or regional authorities.

**Contact tracing**

Within the company, a confidential and robust internal system is necessary to enable tracing of persons that have come into contact with a suspected or active case. In many countries, this would be done in collaboration with the public health authorities, and arrangements made for follow-up tests and treatment as necessary. In countries with little or no health infrastructure, the company may have to assume responsibility for contact tracing and for organizing screening as part of its duty of care to potentially exposed individuals. Contact tracing is a specialist task and should only be performed by a suitably qualified health professional.
Travellers and expatriates

Travellers who anticipate repeated travel or an extended stay over a period of years in an endemic country, should be advised to have a baseline screening test for TB status before initial travel.

Anyone found to have active TB should be restricted from travel until they are no longer infectious. Long-term expatriates in high-prevalence countries should be educated to recognize the signs and symptoms of TB and should be screened upon return. They should also be advised of the importance of screening domestic help and drivers. According to the WHO\(^5\), the risk of acquiring TB infection during air travel is similar to that associated with other activities in which contact with potentially infectious individuals may occur (e.g. train travel, bus travel, any gathering in enclosed spaces). Only passengers in the same section of the aircraft appear to be at risk. This risk is minimal in flights under eight hours duration.

Health services

Staff at company-operated clinics should be trained to identify suspected cases, address and carry out basic diagnostic procedures, and take part in TB treatment. They should follow strict infection control practices for their own protection, including the use of special masks when in close contact with active TB cases. Areas should be assigned where patients can be isolated when necessary. It is important that outsourced medical providers are able to follow the same principles.

Suppliers and contractors

Contract staff and other suppliers to the company who work in close proximity to the primary workforce should be included in the TB prevention programme; failure to include this population may result in the disease being spread among the primary workforce. In circumstances where large numbers of expatriate workers from high-burden areas are expected to be employed on a major project, fitness-for-task assessment in the home country should include TB screening.

Resources for developing a workplace TB programme

Many organizations exist that are willing to provide information and assistance in developing a workplace TB programme. Learning from the experience of others who have already implemented such programmes will save time and money. See Appendix 4 for details of such organizations. If circumstances warrant it, the workplace TB management programme could include an outbreak notification system as part of a formal Outbreak Response Plan (ORP). In the event that this is not available or has not been set up, there are basic initial steps that facility managers and supervisors can take if a TB case is suspected. These would include designation of a company and/or a facility contact person, liaison with public health authorities, contact tracing and notification, and initiation of enhanced sanitation and hygiene measures (Appendix 5 provides additional information).
Appendix 1: TB incidence, prevalence and mortality

Estimated TB incidence (the number of new infections per year), prevalence (the number of people infected at a given point in time) and mortality for each WHO region in 2008

Data from WHO Factsheet No. 104, March 2010 (www.who.int/mediacentre/factsheets/fs104/en/index.html)
Appendix 2: Methods for detecting tuberculous infection, and their application in the workplace

**Detecting tuberculosis infection**
1. In-vitro test using a whole blood specimen to measure the production of interferon-gamma (IFN-g) when incubated with antigens of *M. tuberculosis* and *M. bovis*. It will detect latent tuberculosis as well as TB disease. The test only requires one clinic visit and is not altered by BCG vaccination.
2. Tuberculin Skin Test (TST) (also known as PPD test or tuberculin test): an extract of antigens of *M. tuberculosis* is injected into the skin of the forearm, and changes in the skin 48–72 hours later are read by a physician. A positive response can be due to TB disease, latent infection or BCG in the past, and the test requires two clinic visits.
3. X-ray, usually of the chest: ionizing radiation regulations restrict the use of a chest X-ray as a screening method in many countries, although it plays a part in the diagnostic process.
4. Sputum examination with microscopy and culture is used to identify cases of active respiratory TB.

**Screening of high-risk groups**
It is helpful if the following high-risk groups are screened for active tuberculosis:
- Contacts of sputum-positive tuberculosis cases.
- Persons with known HIV infection.
- Expatriate workforces from countries with high tuberculosis prevalence.
- Persons who have been previously institutionalized (e.g. in prison, drug rehabilitation centres) and are re-entering the workforce.
- Health-care workers.

The level of ‘TB burden’ is calculated using a number of different factors (TB prevalence, TB incidence, TB death rate). The list of countries defined as ‘high burden’ by the WHO is available at: www.who.int/tb/publications/global_report/2007/annex_1_download/en/index.html

Workplace programmes in countries with a high burden of disease should include:
- Easily accessible screening programmes, preferably in collaboration with local programmes and ideally workplace-based. Early diagnosis and treatment of persons with active TB are the cornerstone of any TB prevention effort. The screening should include a TB questionnaire and either a blood test that detects TB interferon-gamma or a TST or, in some circumstances, a chest X-ray.
- Diagnostic services to determine if an individual testing positive has active disease or latent TB.
- Access to treatment. In some circumstances it is possible to facilitate treatment by administering medications at the workplace. Where that is not feasible, companies can ensure employees have access to the appropriate medication and fully understand the importance of complying with the complete course of treatment.
- A link to HIV workplace programmes. HIV testing should be offered to all workers with active TB and those workers who are HIV positive should be offered TB screening. Many companies already have strong workplace HIV programmes in place; existing HIV programmes can provide an excellent platform from which to bolster TB activities.
- Monitoring and evaluation.
- Community engagement, essential to ensure the success of a workplace TB programme. Companies should identify national tuberculosis programmes or NGOs active in the community, and identify areas for efficiency by combining resources and providing support to their efforts. This should include ensuring referral mechanisms for screening, diagnosis and treatment of family members of workers infected with TB.
Appendix 3: International Labour Organization TB 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. Workplace programmes should be gender-sensitive, taking into account women’s greater vulnerability to TB, and its impact as a result of higher levels of poverty, the burden of care and the increasing incidence of HIV among women.

Non-discrimination

No one should experience discrimination on the basis of their TB status, whether in terms of continuing employment relationships or access to health insurance, occupational safety and health-care schemes. Employees with TB should be entitled to work for as long as they are medically fit and appropriate work is available.

Confidentiality

Neither job applicants nor employees should 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 be in accordance with 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. The DOT approach is preferred. Measures to accommodate and support workers with TB should be made through flexible leave arrangements, rescheduling of working times, and arrangements for return to work.

Social dialogue

Control and management of TB in the workplace is more effective when 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.
Appendix 4: Resources for developing a workplace TB programme

When developing a workplace TB programme, it can be both time- and cost-efficient to consult with other organizations who already have relevant experience. These include, among others:

- **Other companies** doing business in the area, both in the oil and gas industry and in other sectors, are a valuable source of information. Companies are generally more than willing to share information on their health initiatives. They will be able to provide guidance on interfacing with the local health authorities, together with advice on local customs and practices, where to obtain awareness materials, and general lessons learned.

- **The national TB programme** is likely to have awareness materials that are appropriate to your community; it will also be able to provide advice on local regulations and resources. In most countries, the national TB programme will be an important partner in providing information.

- **The Global Business Coalition** on HIV/AIDS, Tuberculosis and Malaria (GBC) mobilizes international business against HIV/AIDS, tuberculosis and malaria. The rapidly expanding alliance of 220 international companies is dedicated to combating these diseases through the business sector’s unique skills and expertise. See: www.gbcimpact.org

- **The Stop TB Partnership** was established in 2000 to realize the goal of eliminating TB as a public health problem, with the ultimate goal of achieving a world free of TB. It comprises a network of international organizations, countries, donors from the public and private sectors, governmental and non-governmental organizations and individuals who have expressed an interest in working together to achieve this goal. See: http://www.stop_tb.org

- **The World Economic Forum, Global Health Initiatives (GHI)** is dedicated to forming partnerships between private businesses and the public sector to address HIV/AIDS, TB and malaria. Their aim is to deliver tangible results that benefit both communities and businesses. They will be able to refer you to private-sector groups that have established workplace TB programmes, and can put you in contact with NGOs active in your area. See: www.weforum.org/en/initiatives/globalhealth/index.htm

Other companies in the area who may have relevant experience in TB management, both in the oil and gas industry and in other sectors, can be a helpful resource.
Appendix 5: A model for responding to a suspected case or potential outbreak of TB in the workforce


1. Convene the potential outbreak team with representation from local, regional (if applicable), state and public health laboratories. Identify potential consultants, including CDC. Review legal issues, authority, and roles, and identify the lead agency.

2. Review epidemiologic and genotyping data and establish what is needed to answer the question, ‘Has a TB outbreak occurred?’

3. Clarify mechanisms for internal communication among the outbreak team (remember the team likely includes representatives from several agencies and institutions); in particular, describe channels of communication regarding new information about suspected cases, contact investigations and laboratory data, including genotyping results.

4. Identify media spokesperson(s).

5. Review guidelines for contact investigations and ensure that protocols exist for other potential outbreak response activities.

6. Identify additional resources that may be needed, including financial resources and staffing. Discuss potential sources to obtain additional resources.

7. Enhance surveillance for TB cases (remember that this will often be associated with notification of health-care providers, as noted below).

8. Decide whether or not to issue a media release or health alerts to health-care providers, or to make special contact with certain groups, depending on the initial epidemiology (e.g. prisons, homeless shelters, schools, etc.).

9. Provide basic TB education to public health staff and plan for health-care provider training and education.

10. Decide when to contact community partners.

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6 US Government Centers for Disease Control and Prevention
IPIECA is the global oil and gas industry association for environmental and social issues. It develops, shares and promotes good practices and knowledge to help the industry improve its environmental and social performance; and is the industry’s principal channel of communication with the United Nations. Through its member led working groups and executive leadership, IPIECA brings together the collective expertise of oil and gas companies and associations. Its unique position within the industry enables its members to respond effectively to key environmental and social issues.

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OGP represents the upstream oil and gas industry before international organizations including the International Maritime Organization, the United Nations Environment Programme (UNEP) Regional Seas Conventions and other groups under the UN umbrella. At the regional level, OGP is the industry representative to the European Commission and Parliament and the OSPAR Commission for the North East Atlantic. Equally important is OGP’s role in promulgating best practices, particularly in the areas of health, safety, the environment and social responsibility.

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The Global Business Coalition on HIV/AIDS, Tuberculosis and Malaria (GBC) is an alliance of 220 international companies leading the business fight against HIV/AIDS, TB and malaria. GBC works to leverage the private sector’s unique skills and expertise in the global response, including: developing comprehensive workplace policies; supporting community programmes; utilizing core competencies; facilitating leadership and advocacy by business leaders; and brokering public-private partnerships. The official focal point of the private sector delegation to the Global Fund to Fight AIDS, Tuberculosis and Malaria, GBC maintains offices in New York, Paris, Johannesburg, Beijing, Geneva, Nairobi and Moscow.

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