

# TUBERCULOSIS IN THE SOUTH AFRICAN MINING INDUSTRY

## Fact sheet



**MINERALS COUNCIL**  
SOUTH AFRICA



 AngloGold Ashanti

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**Tuberculosis (TB) is a significant public health challenge in South Africa. The World Health Organisation (WHO) estimated an incidence of 454,000 cases of active TB in South Africa in 2015.**

Source: [www.tbfacts.org/tb-statistics-south-africa](http://www.tbfacts.org/tb-statistics-south-africa)

Almost 1% of South Africa's population of about 54 million people develops active TB each year – or 860 per 100,000 to use the conventional measure – among the highest rates in the world.

It is estimated that about 80% of the population of South Africa is infected with TB bacteria. The vast majority have latent rather than active TB disease. TB remains latent for as long as a person's immunity is high, but manifests once the immunity is low. The highest prevalence of latent TB, estimated at 88%, has been found among people in the age group of 30 to 39, living in townships and informal settlements.

TB is usually spread from person to person through the air by droplet nuclei produced when a person with pulmonary or laryngeal TB coughs, sneezes or talks. Individuals with latent TB are not infectious but highly infectious when the disease is no longer dormant.

Because of this epidemiology, TB is most pervasive under certain social conditions, many of which are present in South Africa. Experts, including the Minister of Health, have stated that TB in South Africa is most prevalent in prisons and in the mining industry. An article in the *American Journal of Public Health*, drawing on the WHO Commission on Social Determinants of Health, concludes: “Key structural determinants of TB epidemiology include global socio-economic inequalities, high levels of population mobility, and rapid urbanisation and population growth. These conditions give rise to unequal distributions of key social determinants of TB, including food insecurity and malnutrition; poor housing and environmental conditions; and financial, geographic and cultural barriers to health care access.

## QUICK FACTS

387,335



MINERWORKERS SCREENED FOR TB

2,367



MINERWORKERS DIAGNOSED WITH TB

AT LEAST ANNUALLY



ALL UNDERGROUND WORKERS ARE SCREENED FOR TB

BEST PRACTICE



INDUSTRY TB PROGRAMME DEVELOPED BY WHO

In turn, the population distribution of TB reflects the distribution of these social determinants, which influence the four stages of TB pathogenesis: exposure to infection, progression to disease, late or inappropriate diagnosis and treatment, and poor treatment adherence and success.

“These social determinants are among the key risk factors for TB. For example, poor ventilation and overcrowding in homes, workplaces and communities increase the likelihood of uninfected individuals being exposed to TB infection. Poverty, malnutrition and hunger may increase susceptibility to infection, disease and severity of clinical outcome. Individuals with TB symptoms, such as a persistent cough, often face significant social and economic barriers that delay their contact with health systems in which an appropriate diagnosis might be made, including difficulties in transport to health facilities, fear of stigmatisation if they seek a TB diagnosis, and lack of social support to seek care when they fall sick.”

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3052350/>

## TB, HIV AND OTHER DISEASES

People with suppressed immunity are more likely to develop active TB than those with normal immunity. Around 50% to 60% of untreated HIV-positive people infected with latent TB infection will go on to develop active disease. The annual risk of TB in an untreated HIV-positive person is 10% compared to a lifetime risk of 10% in a healthy individual. Immunosuppressive conditions, such as silicosis, diabetes mellitus, and prolonged use of corticosteroids and other immunosuppressive drugs, also increase the risk of progression to active TB.

## TB AND SMOKING

The risk of developing TB is higher in children who are exposed to passive smoking. Continued smoking by persons with active TB is significantly associated with recurrent TB following initial treatment and ultimately death due to the disease.

## TB AND SILICOSIS

Silicosis is an occupational lung disease caused by inhalation of silicon dioxide in crystalline forms such as quartz, cristobalite or tridymite. Workers at greatest risk are those who blast rock and sand, such as miners, quarry workers and stone cutters. People with silicosis have a significantly increased risk of developing active TB. The often quoted figures are that mineworkers with silicosis are six times more likely to develop active TB, and mineworkers with silicosis and HIV are 18 times more likely to develop active TB. Silica dust is considered to be a risk factor for the development of pulmonary TB.

## CLINICAL PRESENTATION OF TB

The main symptoms of pulmonary TB are a persistent cough for more than two weeks or a cough of any duration if HIV-positive; coughing blood; fever for more than two weeks; drenching night sweats; and/or unexplained weight loss (more than 1.5kg in a month).

TB is normally diagnosed when a person displaying the symptoms of TB presents to a doctor or clinic and these symptoms are then investigated. In the high prevalence situation facing South Africa, active case finding is necessary. At mines and increasingly at public health facilities, all patients, regardless of the reason for presenting to the doctor or clinic, are given a TB symptoms questionnaire. All patients who display the symptoms must be tested for TB, and every patient who tests positive for one of the screenings is thoroughly investigated. As not all those with TB will have a cough, a high level of caution is required, particularly with people who are HIV-positive as they may only have one of these symptoms. A history of contact with a person with pulmonary TB increases the likelihood of a TB diagnosis.

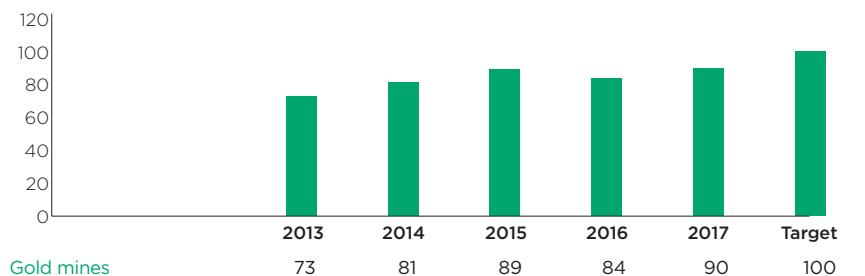
“In South Africa, the increase in the incidence of TB is due, at least partly, to HIV incidence – also extremely high by international standards – which peaked during the mid-2000s.”

“Silica dust is considered to be a risk factor for the development of pulmonary TB.”

## TB IN MINING

Data published by the Department of Mineral Resources shows high levels of screening for TB and a steady decline in the number of reported cases of TB as follows:

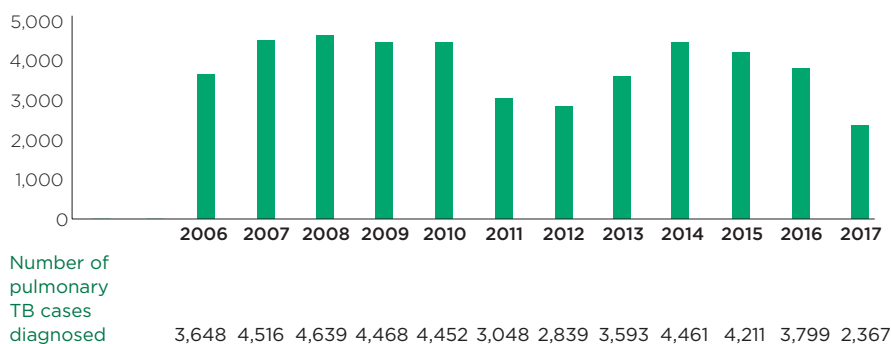
### Employees screened for TB (%)



Gold mines

Source: Department of Mineral Resources, 2017

### Number of pulmonary TB cases diagnosed



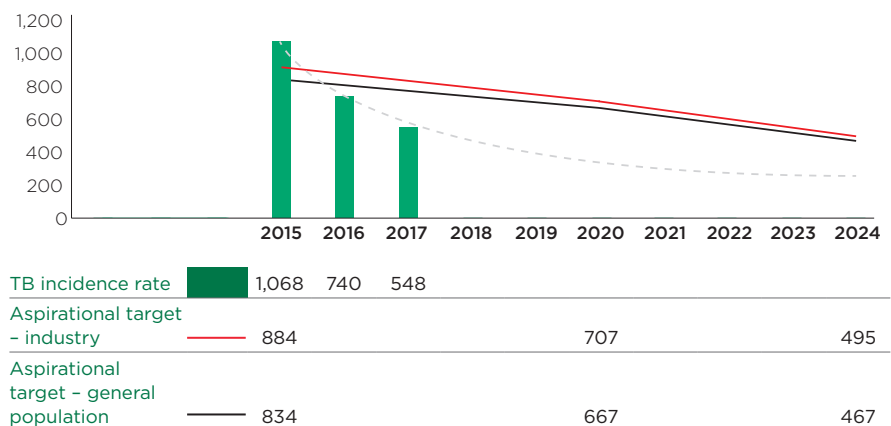
Number of pulmonary TB cases diagnosed

Source: Department of Mineral Resources, 2017 and the Minerals Council

Note: The DMR TB cases from 2004 to 2012 are for occupational TB, while the 2013 to 2016 cases are all for TB.

Through the Mine Health and Safety Council, the industry committed in 2014 to reduce TB incidence to being at or below the South African TB incidence by 2024. The current incidence for TB in Minerals Council members is less than the expected incidence.

### TB incidence in Minerals Council members versus the aspirational MHSC target for 2024



Source: Department of Mineral Resources, 2017

## TB IN MINING

High levels of TB incidence is historically closely linked to mining, particularly gold mining. This is due to several factors, including the concentration of people in workplaces and cramped living conditions, and the incidence of silicosis. It is also recognised that exposure to silica dust and the subsequent impairment of pulmonary functioning may be a contributory factor. Following an initial rise in TB rates in mainly black miners in the early 1900s, these rates declined between 1913 and 1935 following improvements in living conditions. There have been significant improvements in living conditions more recently with the Mining Charter's 2014 target of single rooms in mine hostels having largely been met.

There was a significant increase in TB case notification rates from the mid-1990s. This is believed to partly be due to the rise in the HIV pandemic. In the early 2000s, gold mining companies introduced digital and mobile screening facilities and increased contact tracing efforts. TB rates have again declined since around 2008 as the benefits of anti-retroviral treatment for miners, which companies began to implement in 2002, took effect.

“Due to the high risk of developing TB in the mines, all underground workers are screened at least once a year for TB and a biennial radiograph is carried out.”

## PREVENTION AND TREATMENT OF TB ON MINES

Prevention of TB requires a multi-sectoral, multi-disciplinary approach. Improvements to housing and living conditions have been championed on mines and targets were set (and have largely been met) in the Mining Charter for the conversion of single-sex dormitory style accommodation to single quarters and family units. The control of silica dust is central to reducing the risk of contracting silicosis and TB, and various methods are used to reduce dust levels on mines.

Due to the high risk of developing TB in the mines, all underground workers are screened at least once a year for TB and a biennial radiograph is carried out. Where deemed appropriate, workers are screened even more often. Some companies screen for TB symptoms at every contact with mines' medical services on a typical underground mine, approximately 70% of the workforce would be carrying out underground work.

Where TB is suspected, patients are referred for investigation with sputum testing. They are admitted to hospital for treatment and are released only once they are not infectious. The industry's TB programme is in line with best practice as developed by the WHO.

## COMPENSATION FOR TB

Compensation for TB is regulated by the Department of Health under the Occupational Diseases in Mines and Works Act (ODMWA). Under ODMWA, TB is a compensable disease when "in the opinion of the certification committee, it was contracted while the person concerned was performing risk work, or... was already affected at any time within the 12 months immediately following the date on which that person performed such work for the last time".

Miners who suffer from TB are compensable in two instances. Firstly, where they lose earnings and, secondly, where there is impairment of lung function. In all instances, cases of occupational TB should be submitted to the Medical Bureau for Occupational Diseases (MBOD).

Under ODMWA, a person who works or has worked on a mine has a lifelong right to two-yearly medical examinations to determine whether they have an occupational lung disease. This service is provided by the Department of Health.

ODMWA also provides for medical practitioners to remove the cardio-respiratory organs of any miner who dies from any cause, including TB. This removal of organs is only with the consent of the family and the organs are submitted to the MBOD.

Further, the gold sector's collective bargaining agreement of 2007 provided for extensive additional paid sick leave for employees undergoing treatment for TB of up to six months at a time. This, and any compensation due to mineworkers, needs to be considered in light of the fact that limited earnings loss would be accrued.

## MINERALS COUNCIL POSITION ON TB MANAGEMENT AND CONTRACTORS

The management of TB in contractors has always been an area of vulnerability for the industry with TB reviews (audits) conducted annually from 2010, highlighting the lack of comprehensive TB management for this sub-sector.

The Minerals Council South Africa (Minerals Council) previously conducted a survey on the provision of TB services to contractors. The results indicated that the majority of mining companies were providing similar services for permanent employees and contractors, and that the gaps to be filled in equalising the provision of TB services were not overly burdensome.

The Minerals Council therefore took a decision in 2014 that:

- The management and treatment of TB for long-term contractors should be similar to that of permanent employees.
- Companies should review their protocols to ensure full implementation of the position/standard by the end of 2014.

This was a momentous decision, which will enhance provision of care and health of contractors, and improve the control of TB on the mines.



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