MASOYISE ITB PROJECT

Minerals Council South Africa

MASOYISE iTB

PROJECT DATA REPORT

2018 Report

Contents

Acknowledgment

This report was compiled by Dr Babatunde Sanni (Optidel -Global Public Health) on behalf of the Minerals Council of South Africa. The leadership and guidance of Dr Thuthula Balfour (Head: Health Department) and Dr Khanyile Baloyi (Deputy Head: Health Department) in the development of this report is acknowledged.

Definitions and Acronyms

1. **"Milestones**" for the purpose of this document milestones means voluntarily limitations on exposure levels measurements, health and improvements and safety improvements that have been agreed to by the tripartite stakeholders to further accelerate the mining industry's journey to zero harm.
2. **"Monitoring**" means repetitive and continued observation, measurement, and evaluation of health and/or environmental or technical data, according to pre-arranged schedules, using national or international acceptable method
3. **"Process/Operational Noise** means process or operational noise emitted when an equipment is in operation for its intended use.
4. **"Milestones and Charter Report"** Number of all new cases of Silicosis amongst previously unexposed individuals. Those unexposed to mining dust prior to December 2008 i.e. Equivalent to new persons who entered the industry after December 2008.

   Number of all new cases of Coal Workers Pneumoconiosis amongst previously unexposed individuals. Those unexposed to coal mining dust prior to December 2008 i.e. Equivalent to new persons who entered the industry after December 2008.

   Number of all new cases of Pneumoconiosis resulted from platinum dust exposure amongst previously unexposed individuals. Those unexposed to platinum mining dust prior to December 2008 i.e. Equivalent to new persons who entered the industry after December 2008.
5. ***"Noise Measurement and Exposure (2015 Data)"*** *Number of employees reported with* Standard Threshold Shift (STS) that exceeds 25 dB from the baseline when averaged at 2000, 3000 and 4000 Hz in one or both ears from January 2018.
6. "**Employees screened"** The total number of employees to whom the cough questionnaire was applied to screen for Tuberculosis.

7. "**Pending Report"** The report that had been captured on the Minerals Council South Africa's health information system (Healthsource) but not yet signed off by the authority of the company
8. "**Finalised Report"** The report that had been captured on the Minerals Council South Africa's health information system (Healthsource) and signed off by the authority of the company
9. **"Unaccounted report"** The number of report/s that had not been captured on the Minerals Council South Africa's health information system (Healthsource)
10. "**Expected Report"** The number of reports that the company agreed to submitting (In an ideal situation the number of expected reports should be the same as the sum of pending and finalised report)

Abbreviation

AIDS	Acquired Immune Deficiency Syndrome**.**
CIoM	Chief Inspector of Mines
CoE	Centre of Excellence
dB(A)	Decibels in A scale
DMR	Department of Mineral and Resources
HCT	HIV counseling and testing
HEG	Homogenous Exposure Group
HIRA	Hazard Identification Risk Assessment
HIV	Human Immunodeficiency Virus
MINERALS COUNCIL	Minerals Councils of South Africa
MHSC	Mine Health and Safety Council
MOSH	Mining Industry Occupational Safety and Health
NIHL	Noise-Induced Hearing Loss
PTB	Pulmonary tuberculosis
STS	Standard Threshold Shift
XDR	Extensively drug-resistant Tuberculosis

1. Background

1.1 Introduction

In line with the Global Vision Zero developed by the International Social Security Association (ISSA), the South African mining industry is committed to the principle of zero harm with the goal that every mineworker should return home unharmed every day. The Minerals Council, in conjunction with mining companies, aims to achieve world-class early detection and management of occupational related diseases in line with the United Nations Sustainable Development Goals (Goal) of Ending TB and HIV infection.

The Minerals Council is committed to track progress on concerned illnesses using the Minerals Council Health Information Management System (Minerals Council-HIMS) on the Healthsource platform. The Minerals Council collates data on key threshold indicators from members, validates and evaluate performance against Industry health and safety milestones and produce annual reports on performance.

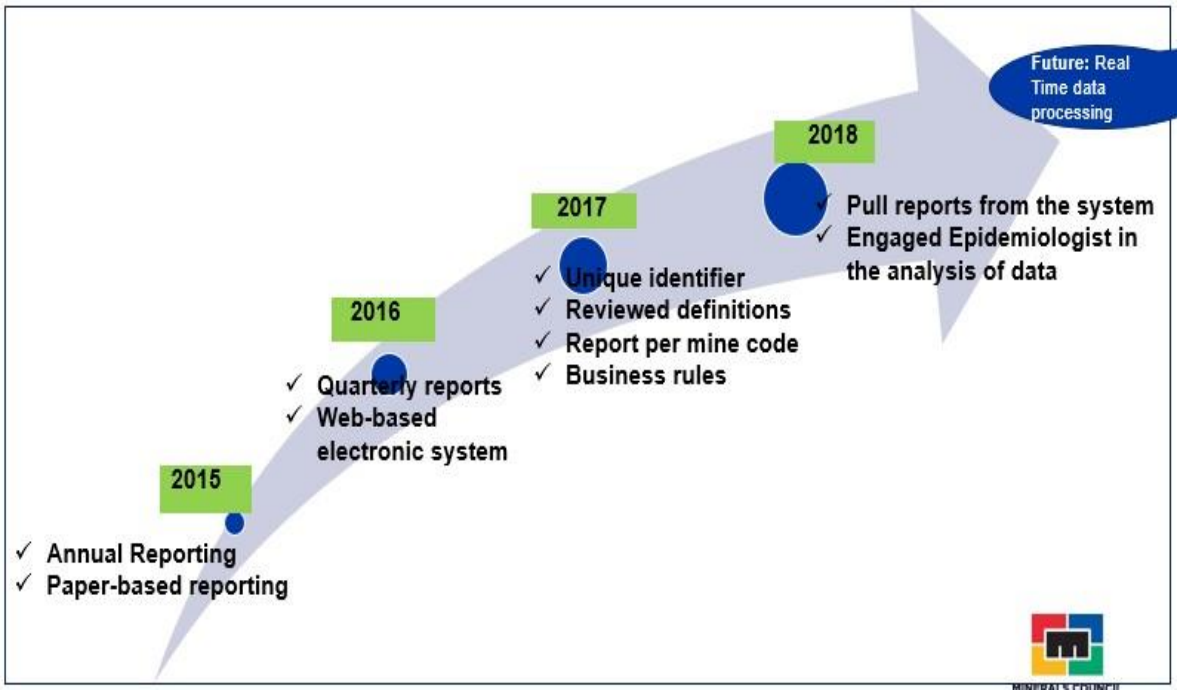
1.2 Data warehouse: Minerals Council HIMS (Healthsource platform)

In order to carry out the performance monitoring responsibilities, the Mineral Council leverages on the data from the Department of Minerals Resources (DMR) for data on TB and HIV for the sector and the occupational health data which is published late; with an average lag of a year. This delay did not allow a real time performance monitoring and caused a delay in implementing corrective intervention where necessary. In addressing the above challenges, the Minerals Council Health Information Management System was designed in 2015 and is hosted by Healthsource. It allowed for quarterly and annual reporting of performance indicators based on the agreed milestone and programmatic data indicators. Furthermore, it is a real time data warehouse with features that ensures data validation checks, use of standardised definitions, unique identifiers and alignment with the DMR and National Department of Health (NDOH) template.

The system is accessible to all companies beyond Minerals Council membership. It enhances the fulfilment of the responsibility of the Minerals Council in monitoring, analysing and interpreting milestone on Masoyise Health Programme (Occupational Medicine) and

Occupational Hygiene data and to provide credible data for reporting purposes to the Employer.

Figure 1: Critical milestone in data processing since 2015



1.3 Methodology

The data used in this report was drawn from the Minerals Council (HIMS) database and the analysis was done using the Excel Spreadsheet to reflect the performance of the industry and commodities against key indicators as reflected on the 30 April 2019. Companies upload their TB and HIV data on the system on a quarterly basis and the annualised data only at year-end. The system prioritised compliance to reporting requirements to ensure that participating companies uploaded and finalised their reports prior to analysis of data. The report took cognisance of the companies that have never reported since 2015 and highlighted the gaps that should be addressed in the database. The Masoyise iTB Project engaged the services of an independent Epidemiologist for the analysis of the data for purposes of development of this report. The lack of verification of data reported on the system remains a limitation and concern about the data presented in this report. The data in this report is comparable when reconciled

and peer reviewed against DMR data and South African National TB data. All DMR data is from the DMR Reports 2013-2017.

1.4 Masoyise indicators overview

The table below (Table 1) shows the Masoyise indicator overview. These indicators comprise both the indicator description and the overview of 2018 performance. The targets set for the project are in line with the DMR 164 TB and HIV Reporting form. The current form is not yet totally aligned to reporting on the full cascade of 90-90-90. The form is being reviewed by the Mining and Health Safety Council (MHSC).

Table 1: Indicator overview

	Activity	**Milestone**	**Industry performance 2018**
Masoyise Health Programme	Compliance to Milestones Reporting	100% compliance	**The target of having all companies finalise 100% of their reports on the system was not met.**
	HIV Counselling and Testing	100% of employees should be offered HIV Counselling and Testing (HCT) annually with all eligible employees linked to an ART programme as per the South African National Strategic Plan for HIV, TB and STIs 2017 -2022 (NSP).	**Target of 100% employees counselled for HIV/AIDS not met**
	TB Screening	Masoyise iTB milestone: to screen, annually, 100% of employees for TB.	**The target of 100% employees screened for**

			TB not met
	TB Incidence	MHSC Milestone: By December 2024, the mining industry TB incidence rate should be at or below the National TB incidence rate.	**The industry is on track to meeting the target of reducing the TB incidence rate to below that of the general population by December 2024.**
	The General Population Aspirational Target of TB incidence reduction	5 % year-on-year reduction for the TB incidence rate	**Industry met 2023 target in 2017, on track to meet the 2024 target**

	Not meeting target
	On track/Met target

2. Data Analysis Report

2.1 Compliance to reporting Requirements

In 2018, 32 companies representing 370,223 employees submitted year-end data translating to a 29,440 (8.6%) increase over the 2017 number of employees. The total number of employees covered by the 32 companies represent about 81% of the estimated 455,226 employees in the mining industry, see Table 1. Companies that submitted data are in **Annexure 1**, while the number of employees in the industry (as supplied by the DMR) is in **Annexure 2.**

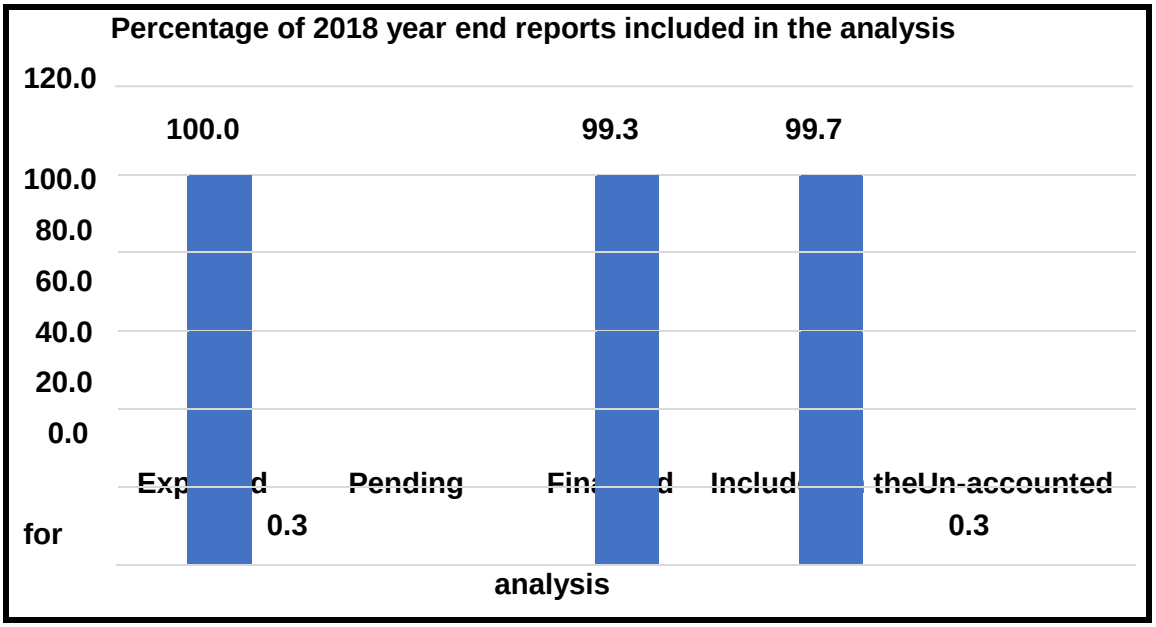
The analysis presented in this report captures the situation as at **30 April 2019**. The analysis excludes 62 companies registered on the Minerals Council HIMS that did not report any data in 2018. The number of companies with reported on the database dropped from 54% (38 out of 70) in 2017 to 34% (32 out of 94) in 2018, this indicates that many (22) new companies had been added to the database since the 2017 report was finalised.

Table 2: Minerals Council member companies as a proportion of Industry

2018	Companies	Employees
Industry		455, 226 (est)
Minerals Council	94	370, 223 (est)
Respondents		
Minerals Council Respondents	32	370,223
As % of industry	-	81,3%

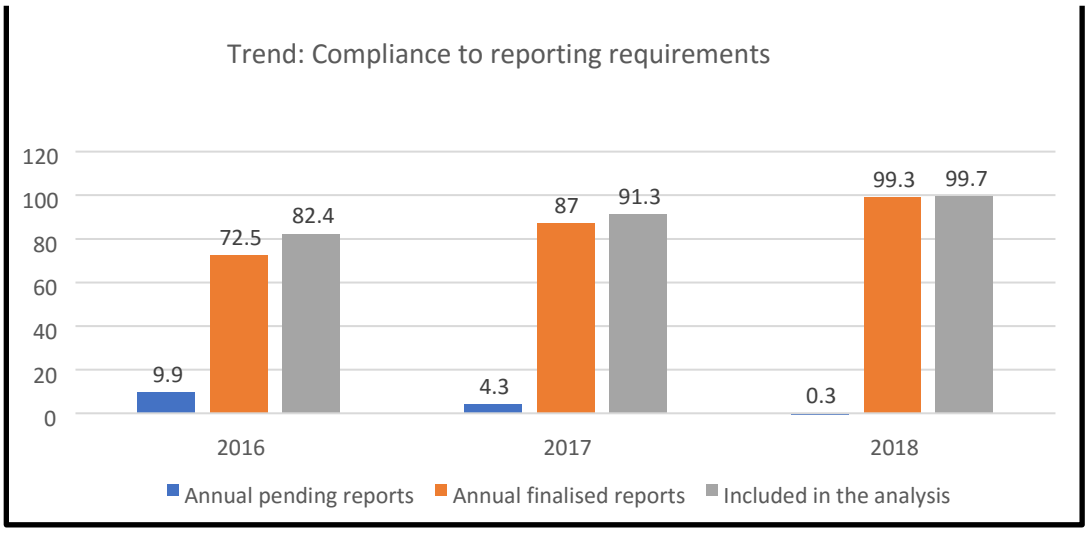
Figure 2 shows there were 99,3% reports finalised and 99,7% were included in the analysis and this make the sample size representative and generalizable. But, the target of "*all companies should finalise 100% of their reports on the system*" was not met.

Figure 2: Percentage of year-end data analysed



The target of the Masoyise iTB report is for all reports to be finalised. Compliance trend to milestone reporting (Figure 3) indicates that there has been a steady increase in annual finalised report and the percentage of data analysed over the last three years between 2016 and 2018. This upward trend is due to the compliance of the companies in submitting and ensuring that pending reports are signed off.

Figure 3: Compliance trend 2016-2018



2.2 Performance of HIV Programme

The aim of the Masoyise HIV programme milestone is for 100% of employees to be offered HIV Counselling and Testing (HCT) annually with all eligible employees linked to an ART programme as per the South African National Strategic Plan for HIV, TB and STIs 2017 -2022 (NSP).

2.2.1. HIV Counselling

HIV Counselling and Testing is the gateway to knowing one's HIV status and facilitates early access to treatment and prevention programme. The policy is for mineworkers to undergo HIV counselling at least once in a year. Hence, it is expected that 100% of the mineworkers with unknown status will undergo HIV testing annually. Table 3 sets out all the performance indicators for HIV.

Table 3: HIV Programme performance

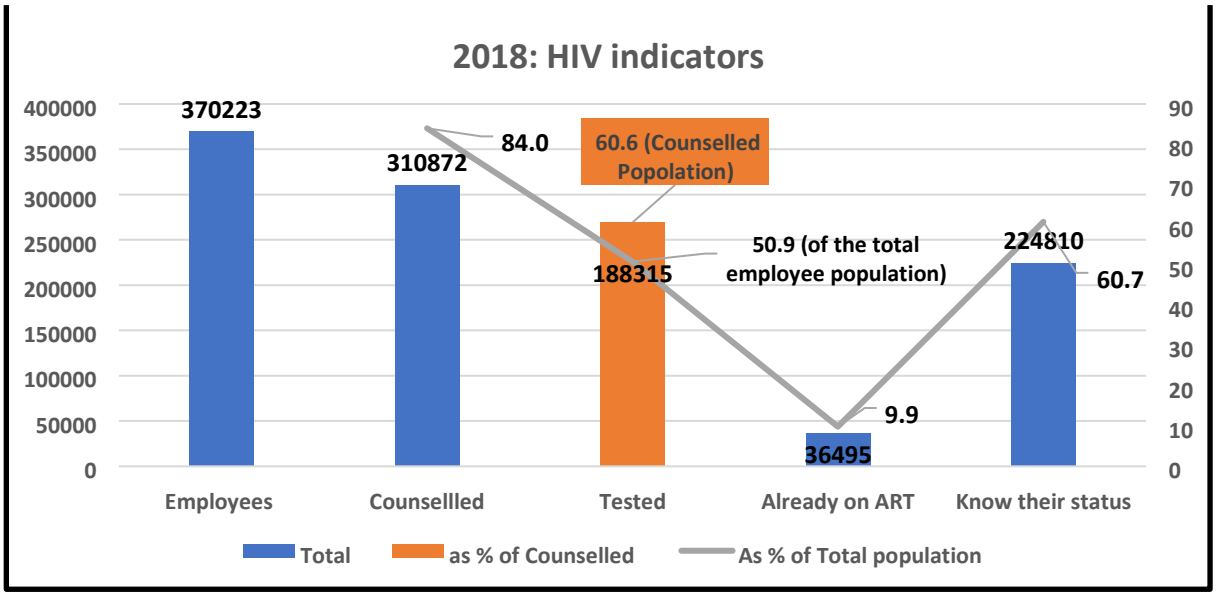
HIV Performance		
	Total	%
Employees	**370223**	**100%**
On ART already	**36495**	**9,9%**
Living with disease but not enrolled on Rx.	**Unknown (Gap)**	
Counselled	**310872**	**84%**
Counselled (+ On ART already)	**347367**	**94%**
Know status -Tested (+ On ART already)	**224810**	**61%**
Tested	**188315**	
% of Counselled tested for HIV		**61%**
Tested positive (Positivity Rate)	**12197**	**6,5%**
Initiated on ART	**319**	**2,6%**
Not enrolled on treatment	**11878**	

On IPT	**13575**	

With 370 223 employees represented on the system, 310 872 (84%) employees were counselled for HIV, and 36 495 (9.9%) employees were identified as on ART already. 188 315 employees were tested for HIV. Among those tested for HIV, the HIV positivity rate is 6,5%. But only 2,6% of those tested HIV are initiated on ART. Furthermore, 13,575 are on IPT.

If an assumption is made that the employees that are on ARVs know their status and were not counselled, and the percentage/number of workers on ARTs is added to those that have been counselled and tested, then the percentage counselled plus those on ARTs increases to 94% (2018) and the proportion of employee with a known status is 61%. Figure 4 is a graphic representation of the HIV performance.

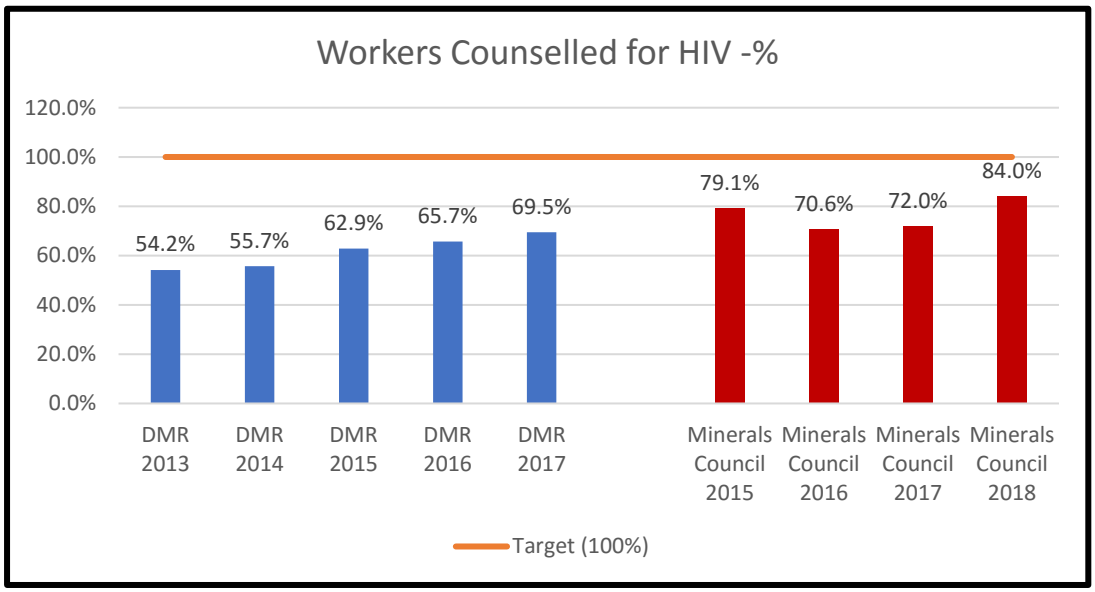
Figure 4: HIV indicators for 2018



Workers Counselled for HIV -%

Figure 5 shows the trend in percentage of workers counselled for HIV between 2015 and 2018 from the Minerals Council data and 2013 -2017 from the DMR data.

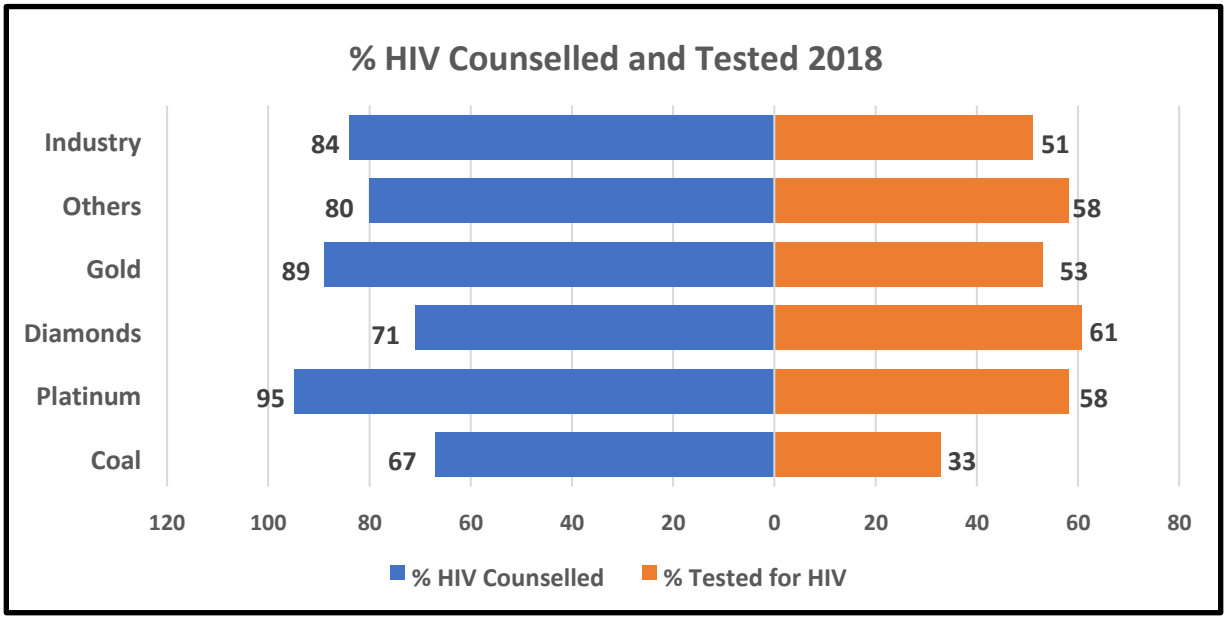
Figure 5: Trend of percentages of workers counselled for HIV



With 84% of employees in the 2018 cohort counselled for HIV this was an improvement over 2017 but the target of counselling 100% of employees was not met.

An analysis of HIV counselling and testing according to commodities is in Figure 6.

Figure 6: Percentage of workers counselled and tested for HIV, according to commodities



Platinum mines counselled the highest proportion of employees (95%), while diamond mines tested the highest proportion (61%) of clients for HIV. Of significant are industries dealing with coal mines that reported the lowest percentages of employees that were counselled for HIV (67%) and tested for HIV (33%) in 2018.

2.3 TB Programme

Mine employees are classified as Tuberculosis High Risk Group in South Africa. Masoyise iTB project monitors the percentage of employees screened for TB annually with a target of screening 100% of employees annually. Masoyise also adopted the MHSC indicator of achieving a TB incidence that is below the National TB incidence rate by December 2024.

The Masoyise programme was designed to address the cardinal pillars of WHO END-TB Strategy of finding the missing cases, early case detection, early and successful treatment, this is also in line with the South African National Strategic Plan for HIV, TB and STIs 2017 2022.

2.3.1. Screening for Tuberculosis

The percentage of employees screened for TB in 2018 is presented in Table 4 and shows that 90.3% of employees were screened for TB. The target of screening 100% of employees was this not achieved.

Table 4: Proportion of workers screened for TB

	Number	**%**
Total Employees	**370,223**	**-**
Employees screened for TB	**334,321**	**-**
% Employees screened for TB	**-**	**90,3%**

The trend in TB screening is presented in Figure 7 and shows that, using Minerals Council data there has been a stagnation in TB screening since 2016, although the DMR data shows higher levels of screening of around 96%.

Figure 7: Trend Proportion of workers screened for TB

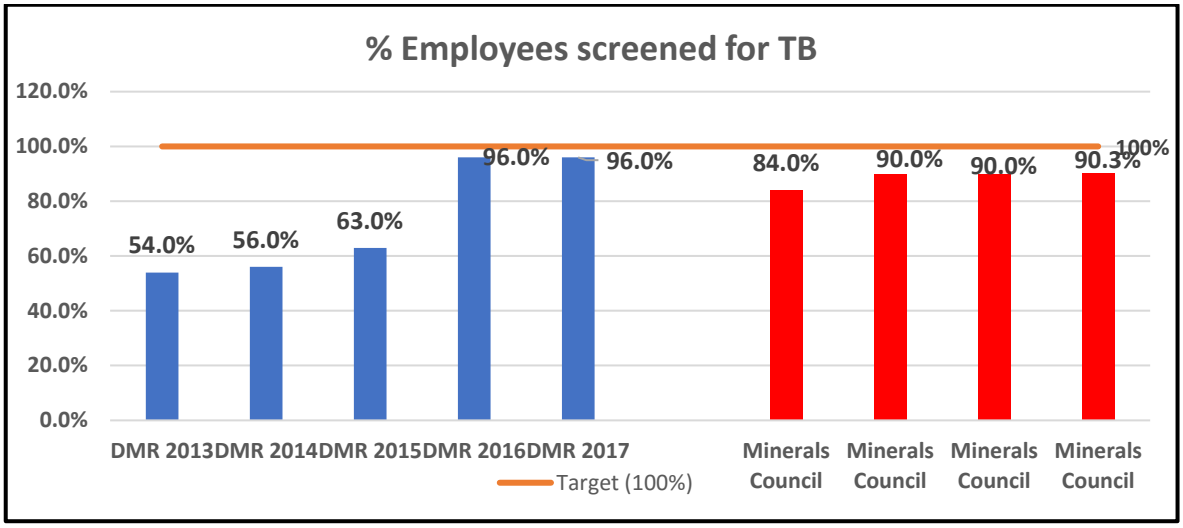
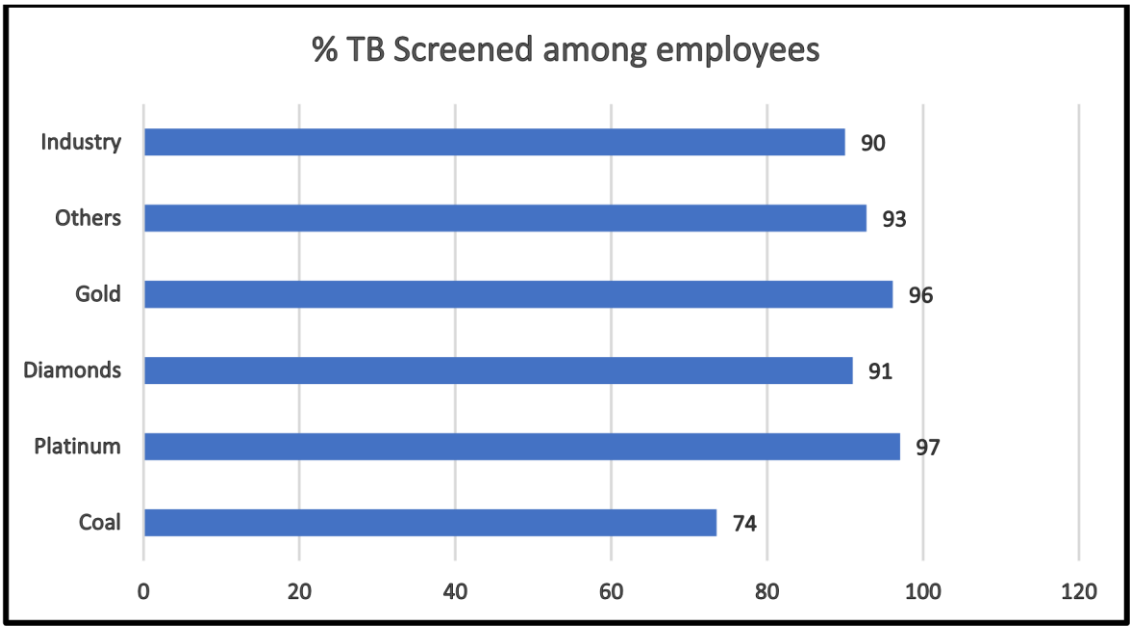


Figure 8 illustrates TB screening across commodities in comparison to the industry.

Figure 8: Percentage of employees screened for TB by commodities



The highest percentage of employees screened for TB was by the platinum mines (97%), and coal mines have the lowest (74%).

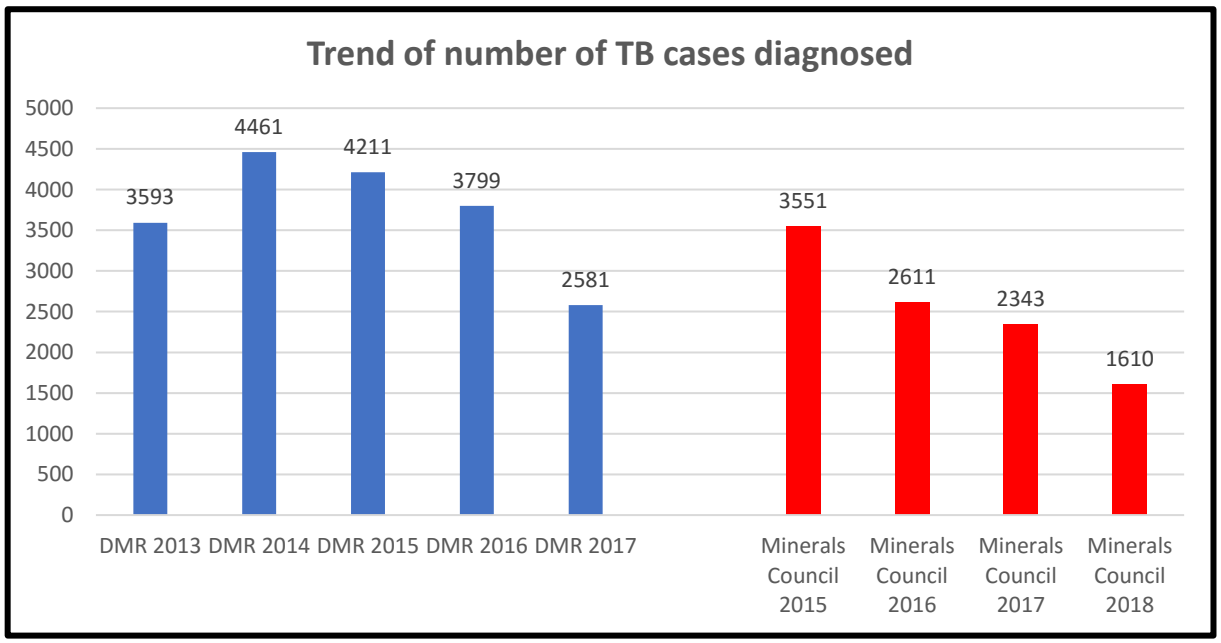
2.3.2 Number of TB cases diagnosed

The TB case detection in the mining sector presented with two peaks in the past 12 years; the first in 2008 and the second one in 2014. Although, the reason for the downward trend after the 2008 peak is generally ascribed to the wide-spread use of ARVs. The second peak and subsequent consistently downward trend in the last 4 years is significant because over the years there has been a significant improvement in the diagnosis of TB. Novel tools like GeneXpert had been introduced, more sensitive screening and diagnostic algorithms are in place and there has been an intensified effort to reduce TB in the mining industry, including through Masoyise iTB.

The downward trend between 2014 and 2018 is also observed at the general population level and it is anecdotally attributed to a general decreasing prevalence of TB in South Africa. This will only be known at the conclusion of the ongoing TB prevalence Survey.

Figure 9 shows the trends in number of cases diagnosed with TB, from both the DMR and Minerals Council datasets.

Figure 9: Trend in number of TB cases diagnosed



There has been a 54.6% decrease in the number of TB cases diagnosed in the industry between 2015 and 2018. The decline from 2017 to 2018 is 31%.

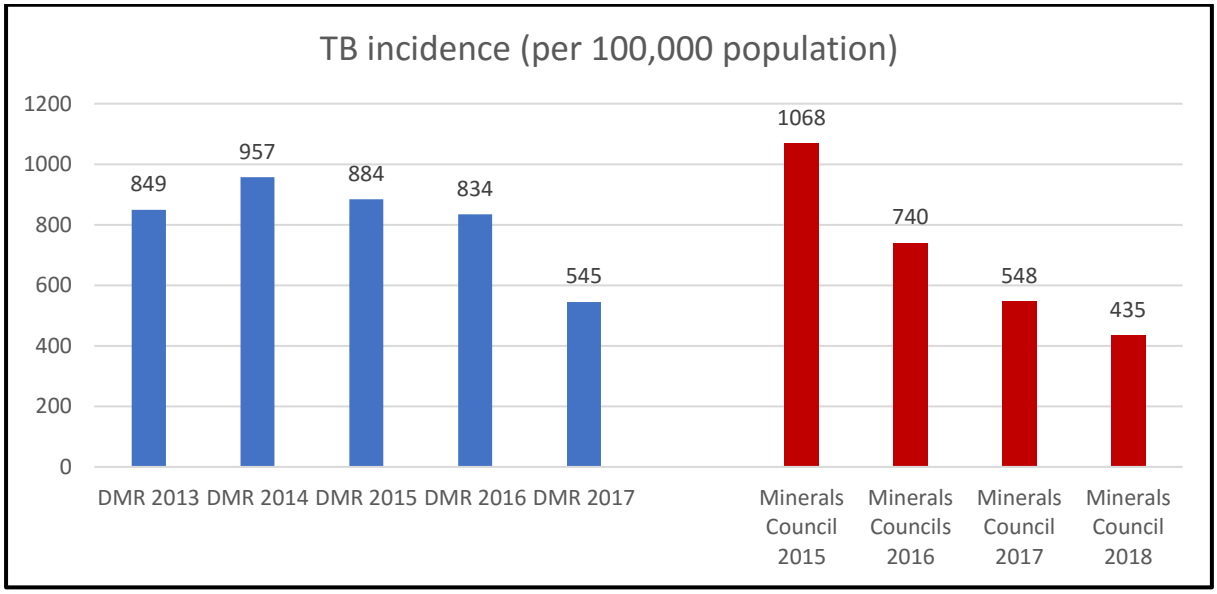
2.3.3 TB incidence

TB incidence is an indication of the ongoing transmission of Tuberculosis. It is important to know the incidence of new TB infection in the Masoyise Programme. The target is for the TB incidence in the mining industry to fall below the National TB incidence rate by December 2024.

The TB incidence is the sum of the TB cases reported over a year divided by the total number of employees in that same year multiply by 100,000 population.

Figure 10 demonstrates a decreasing trend in TB incidence since 2014, this is in consonance with the national profile reported by the South Africa National TB Programme. The Industry (545/100,000), as well as Minerals Council (435/100,000) member companies have not achieved the target of falling below the National TB incidence in this 2018 report. According to WHO Global TB Report 2018, the Incidence rate is still within the range of the WHO estimate for South Africa general population TB incidence (includes HIV+TB) of 567/100,000 (Range: 406-754); the WHO report was released in 2018 but covered data of 2017. South Africa is presently undergoing a Prevalence Survey that will help in establishing the true burden of TB in the country.

Figure 10: TB Incidence (Industry vs Minerals Council)



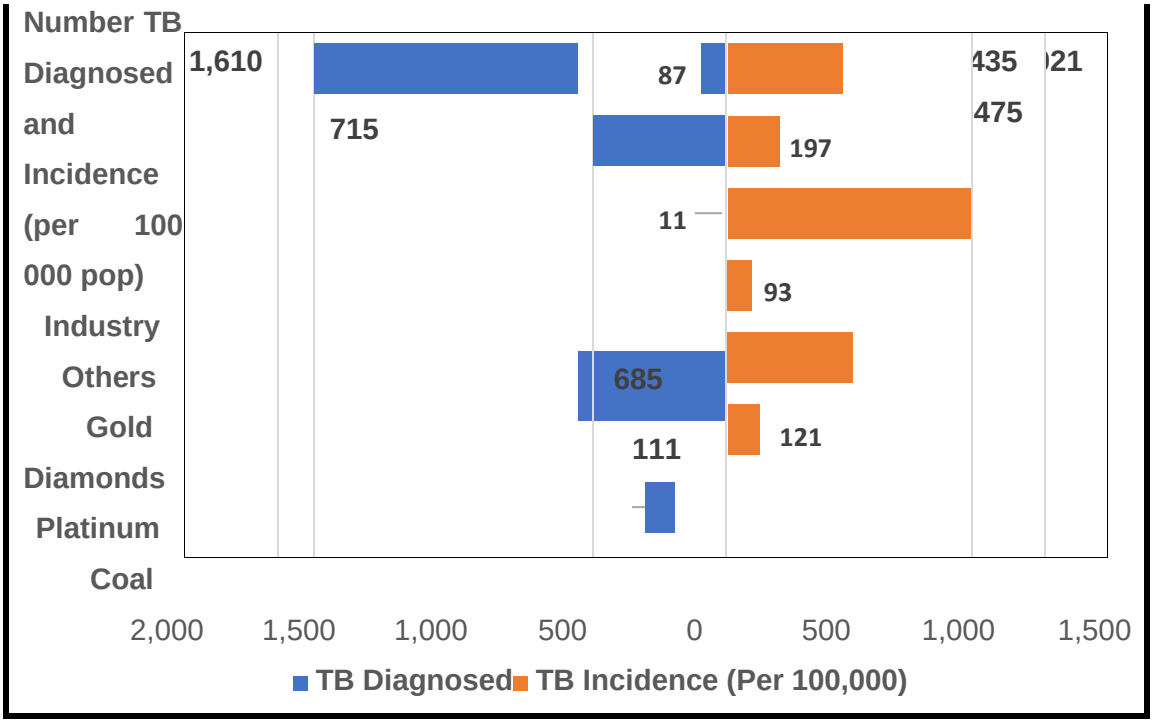
The following should be taken note of in the interpretation of the 2015 incidence rate:

- The TB incidence rate for 2015 was calculated predominantly from data supplied by larger gold and platinum mines, who have always reported higher TB incidence rates, hence the bias towards the upside. A more representative rate, i.e. if all mines reported, would probably lie within the range of 702 -1068/ 100 000 population. Data gathered in 2015 was through a paper-based system which limited the scope to review and adjust for coverage and non-response errors, double counting and alignment with industry data. The new electronic reporting system was implemented to address these issues and has to a certain extent.

2.3.4 TB cases and incidence in commodities

The risks for TB differ across commodities, with gold having the highest risk due to the presence of silica dust. Figure 11 shows the TB cases and TB incidence in across the commodities.

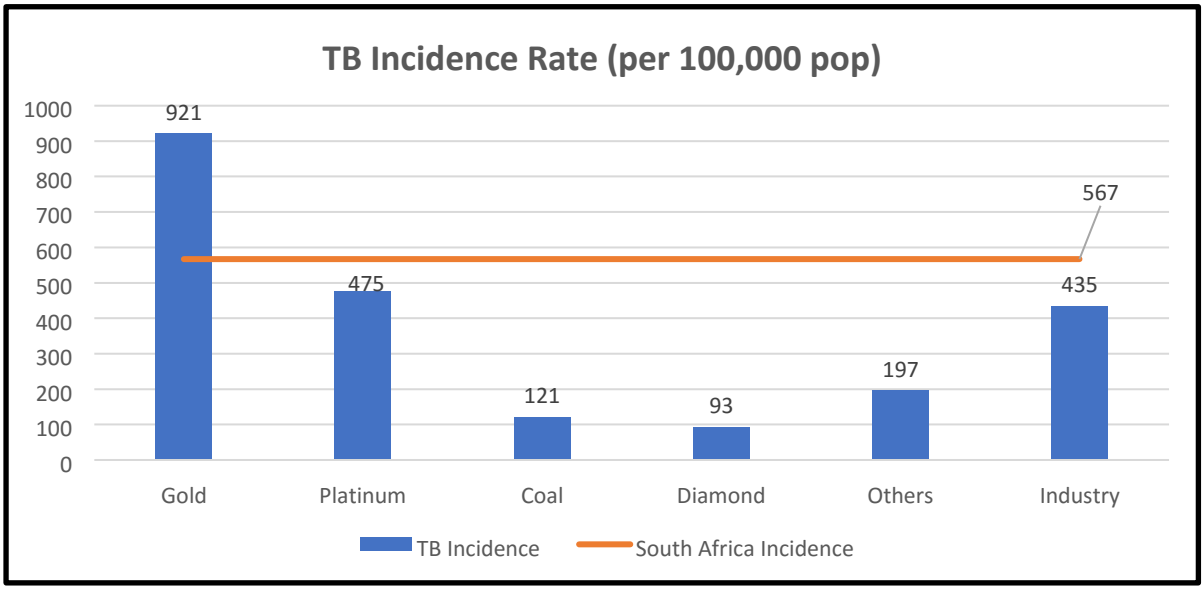
Figure 11: Number of TB cases and TB incidence according to commodities in 2018



Gold mines reported the highest number of cases (715 cases) and incidence (921/100,000 pop) of TB, closely followed by platinum mines (685 cases) and incidence of 475/100000pop, while diamond mines reported the lowest cases (11 cases) and incidence.

Figure 12 illustrates the incidence while comparing it to the South African TB incidence for 2017.

Figure 12: TB incidence by commodities

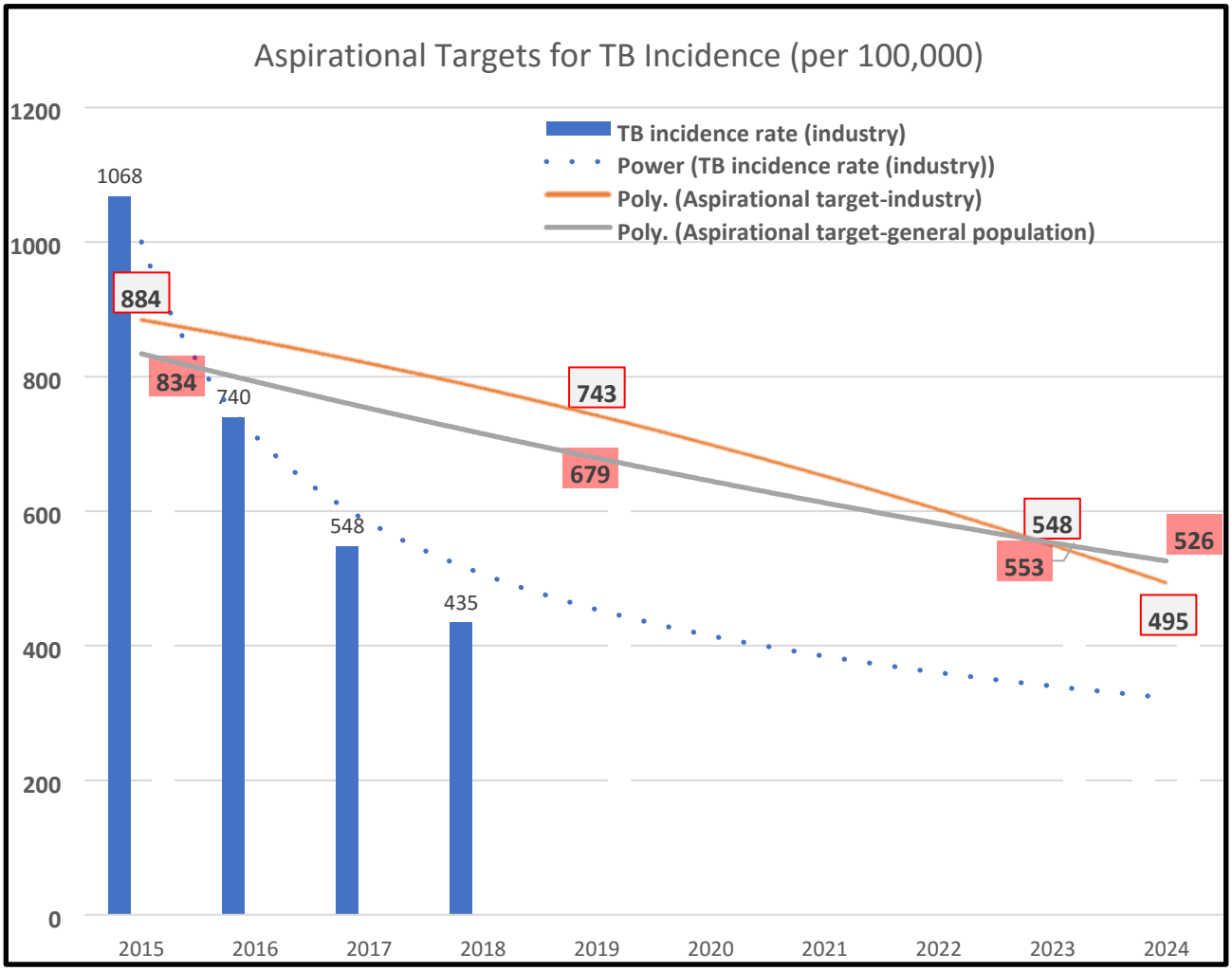


All commodities, except gold, fall below the South African TB incidence.

2.3.5 TB incidence Aspirational curve

The industry committed to reducing the TB incidence to at or below the South African average. Aspirational curves were developed to monitor this commitment and as shown in Figure 13 below, the trend in TB incidence from 2015 through 2018 falls well within the expected range that will enable the industry to meet its milestone target by 2024.

Figure 13: Aspirational Targets Industry vs. General population



Currently the industry is well below the aspirational targets and is on track in meeting the aspirational target.

3.1. Summary of Achievements and Challenges experienced

The Minerals Council has had four years' experience with data collection, three of these utilising an electronic reporting system. A lot of achievements and challenges were met in the process and these are tabulated in Table 5 below.

Table 5: Summary of achievements and challenges

Achievements	Challenges and mitigation
✓ Improvement in the compliance to Masoyise reporting ✓ Number of employees captured on the system is increasing ✓ Existence of a good database and unique identifiers to eliminate double counting ✓ Good performance in TB Screening indicators ✓ Consistent fall in TB incidence rate consistent with WHO projections ✓ TB incidence for the industry on a good trajectory to meeting the Aspirational Targets	✓ Non- compliance registered companies ✓ HIV Counselling target not met ✓ Reduce the proportion of unaccounted report on the system ✓ Impact of retrenchments on data management ✓ Impact of sale and acquisition of assets (mines) ✓ Data system quality assurance limitations ✓ System's functionality limitations

ANNEXURES

Annexure 1:

Companies that submitted 2018 Data

2018 Companies compliant on the system	Year-End Expected	Year-End Pending	Year-End Finalised	Year-End Unaccounted	Companies
African Rainbow Minerals	13	0	13	0	1
AfriSam (SA) Pty Limited (ASPASA)	17	0	17	0	1
Anglo Coal South Africa	18	0	18	0	1
Anglo Platinum South Africa	20	0	20	0	1
AngloGold Ashanti	10	0	10	0	1
De Beers Consolidated Mines (Pty) Ltd	4	0	4	0	1
DRD Gold Limited	2	0	2	0	1
Evander Gold Mining Pty Ltd	2	0	2	0	1
Evraz Vametco	2	0	2	0	1
Exxaro	21	0	21	0	1

Glencore Coal South Africa	**16**	**0**	**16**	**0**	**1**
Glencore Ferro Alloys South Africa	**17**	**0**	**17**	**0**	**1**
Gold Fields Limited	**2**	**0**	**2**	**0**	**1**
Harmony Gold	**43**	**0**	**43**	**0**	**1**
Impala Platinum	**4**	**0**	**4**	**0**	**1**
Kumba Iron Ore	**5**	**0**	**5**	**0**	**1**
Kuyasa Mining (Pty) Ltd	**2**	**0**	**2**	**0**	**1**
Lonmin	**2**	**0**	**2**	**0**	**1**
Makana Brick	**2**	**1**	**0**	**1**	**1**
Mbuyelo Coal	**4**	**0**	**4**	**0**	**1**
Petra Diamonds	**10**	**0**	**10**	**0**	**1**
Richards Bay Minerals	**2**	**0**	**2**	**0**	**1**
Royal Bafokeng Platinum	4	0	**4**	**0**	**1**
Sasol Mining (Pty)Ltd	17	0	**17**	**0**	**1**
Sephaku Cement PTY (LTD)	1	0	**1**	**0**	**1**
Seriti Resources Holdings Propriety Limited	9	0	**9**	**0**	**1**
Shiva Coal	2	0	**2**	**0**	**1**
Sibanye Gold Limited	7	0	**7**	**0**	**1**

Sibanye Rustenburg Platinum	16	0	**16**	**0**	**1**
South32 SA Coal Holdings (Pty) Ltd	11	0	**11**	**0**	**1**
Universal Coal Pty Ltd	2	0	**2**	**0**	**1**
Wesizwe Platinum	1	0	**1**	**0**	**1**
Total	288	1	**286**	**1**	**32**

Annexure 2:

Number of employees according to commodities, in 2018

	Total Employees	**Employees**	**Contractors**	**Male (at total level)**	**Female (at total level)**
M0: All Mining Commodities	455226	301165	154062	397312	57915
Gold	100251	87164	13087	88142	12109
Platinum Group Metals (PGM)	167041	119537	47504	147703	19338
Diamonds	16264	9507	6757	13903	2361
Chrome	18923	12892	6032	15763	3161
Iron	18614	8863	9751	15874	2740
Manganese	9333	4251	5082	7852	1481
Non-Ferrous Metals	16483	7913	8571	14129	2355
Coal	89433	37545	51888	77762	11671
Salt	698	675	23	543	155

Special Clays	288	241	48	212	77
Limestone And Lime	2717	1828	889	2351	367
Dimension Stone	1363	1249	113	1279	83
Aggregate And Sand	7335	6072	1263	6307	1027
Brickmaking Materials	370	340	31	328	42
Other Minerals	6112	3089	3023	5165	947

Source: Department of Mineral Resources, 2019