



**NATIONAL HEALTH  
LABORATORY SERVICE**

NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH

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## **Pathology Division Surveillance Report**

### **Demographic Data and Disease Rates for January to December 2010**

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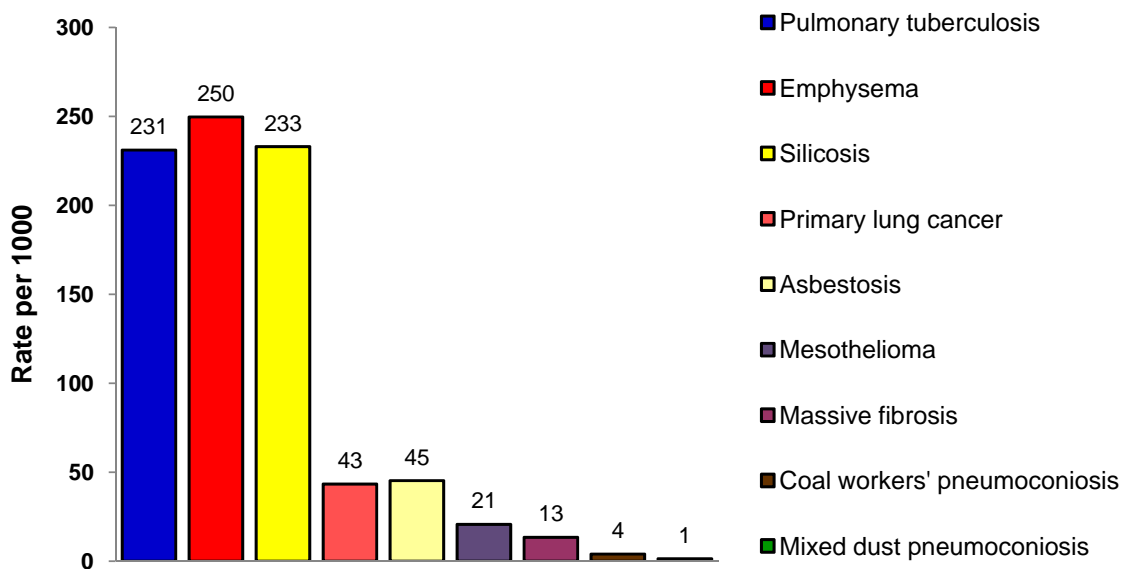
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## EXECUTIVE SUMMARY

During 2010, 1 502 deceased cases were examined at the NIOH. Of these, 63.9% were black, 34.7% were white, 1.0% were coloured and 0.4% were submitted without information on population group. Of the cases submitted, 44.8% (n=673) cases were ex-miners, 51.5% (n=774) current miners and 3.7% (n=55) cases could not be classified.

The overall disease rates (per 1000 autopsies) for 2010 are shown in Figure 1.



**FIG.1 OVERALL DISEASE RATES FOR 2010**

The overall rate of pulmonary tuberculosis (PTB) in 2010 (231/1000) was lower than that in 2009 (251/1000). The rate in black gold miners remains high (384/1000 in 2010). In black platinum miners, a decrease from 360/1000 in 2009 to 289/1000 in 2010 was observed.

The overall silicosis rate in 2010 (233/1000) was similar to that in 2009 (237/1000). The rate in black gold miners increased from 354/1000 in 2009 to 378/1000 in 2010.

Thirty two women came to autopsy in 2010, 25.0% (n=8) of whom had diseases related to asbestos exposure in mining or in the environment.

In 2010, a new field naming the province or foreign country from which the organs were sent was added to the PATHAUT database. Table 1 shows the distribution of cases by province or country and population group.

**TABLE 1 DISTRIBUTION OF AUTOPSY CASES BY PROVINCE AND POPULATION GROUP (2010)**

Province or country	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
Eastern Cape	7	0.7	2	0.4	0	-	0	-	9	0.6
Free State	274	28.5	67	12.9	2	13.3	0	-	343	22.8
Gauteng	64	6.7	193	37.0	2	13.3	0	-	259	17.2
Kwazulu-Natal	4	0.4	15	2.9	0	-	0	-	19	1.3
Limpopo	7	0.7	3	0.6	0	-	0	-	10	0.7
Mpumalanga	49	5.1	45	8.6	0	-	0	-	94	6.3
North West	433	45.1	178	34.2	0	-	3	50.0	614	40.9
Northern Cape	94	9.8	9	1.7	9	60.0	1	16.7	113	7.5
Western Cape	2	0.2	9	1.7	2	13.3	0	-	13	0.9
Lesotho	26	2.7	0	-	0	-	2	33.3	28	1.9
<b>Total</b>	960		521		15		6		1 502	

The type (commodity), duration of service and last mine worked were not provided for 28 (1.9%), 46 (3.1%) and 33 (2.2%) of the cases respectively.

In recognition of the annual decreases in the numbers of cardio-respiratory organs submitted for autopsy (Table 2-1), the Pathology Division launched a programme in 2006 to inform miners and ex-miners of their rights to autopsy examination. The Division has continued to engage occupational health units on the mines, union representatives, undertakers, state hospitals and forensic laboratories (Appendix 2).

During 2010, 5 journal articles utilising PATHAUT data were published (Appendix 2). Research findings were presented at a number of fora and the PATHAUT data were also used for an ongoing PhD study (University of the Witwatersrand).

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## GLOSSARY

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<b>Asbestosis</b>	Lung fibrosis caused by asbestos fibres
<b>Coal workers' pneumoconiosis</b>	Lung fibrosis caused by exposure to coal dust
<b>Emphysema</b>	Lung disease caused by the destruction of the alveolar walls
<b>Massive fibrosis</b>	Lung fibrosis caused by exposure to dust and measuring more than 1 cm in diameter
<b>Mesothelioma</b>	A malignant tumour of the pleural cavity of the lungs
<b>Miner</b>	A person who has worked in a controlled mine or works
<b>Mixed dust pneumoconiosis</b>	Lung fibrosis caused by simultaneous exposure to multiple dust types
<b>Prevalence</b>	The number of cases in a defined population at a given time
<b>Silicosis</b>	Lung fibrosis caused by inhalation of silica dust; detected by the presence of silicotic nodules in the lung tissue
<b>Surveillance</b>	The ongoing and systematic collection, analysis and interpretation of data related to adverse health outcomes
<b>Environmental asbestos exposure</b>	Non-occupational asbestos exposure. Such cases are examined at the NIOH but are not submitted to the MBOD for compensation.

## SECTION 1 – BACKGROUND

---

The Occupational Diseases in Mines and Works Act, 1973 (Act 78 of 1973) requires that the cardio-respiratory organs of a deceased person who has worked at a controlled mine or a controlled works be examined for the presence of occupational disease, regardless of the clinical cause of death and provided that the next of kin agrees. These examinations are performed by pathologists at the National Institute for Occupational Health (NIOH). A detailed report on each case examined is sent to the Medical Bureau for Occupational Diseases (MBOD). Cases certified as having a compensable disease are then referred to the Compensation Commissioner's office, where the payment for compensation is managed.

Since 1975, the pathological findings from the autopsy examinations have been recorded on the computerised PATHAUT database. PATHAUT comprises data from autopsy examinations and clinical files which include occupational histories. The database is unique and provides an important resource for both surveillance and research. These data are the only comprehensive surveillance data on occupational lung disease in the South African mining industry.

The data presented in this report summarise the PATHAUT system surveillance results, i.e. the results of the systematic collection, collation, and analysis of the pathology findings in the cardio-respiratory organs of mine workers. Data from PATHAUT are exported into, and analysed, using SAS v9.2.

This is the fourteenth consecutive annual report and describes autopsy cases examined during the year 2010. Some of the earlier reports and this report can be accessed at [http://www.nioh.ac.za/publications/publications\\_pathaut\\_reports.htm](http://www.nioh.ac.za/publications/publications_pathaut_reports.htm).

Throughout this report, the term 'men' and all data refers to both men and women, with the exception of Section 10 which reports findings in women only.

Many of the cases had "mixed" exposures in that they had been employed in more than one commodity. For simplicity, cases are categorised according to the commodity in which most years of service were recorded, i.e. the commodity in which the miners had worked for the longest period. In Appendix 1, however, the cases are listed according to the most recent (last) mine at which the miners worked.

All disease rates reported in this document are expressed per 1000. In all calculations, the denominators used are the total numbers of autopsies in specific commodities, age groups or population groups. Some of these rates must be viewed with caution, as the denominators are very small. This applies, for example, to those commodities where few workers are employed (such as manganese mining), and to the older age groups in some instances.



## SECTION 2 – DEMOGRAPHIC DATA

The numbers of autopsies performed annually since 1975 are presented in Table 2-1.

**TABLE 2-1 DISTRIBUTION OF AUTOPSIES BY YEAR AND POPULATION GROUP (1975 - 2010)**

Year of autopsy	Black		White		Coloured		Indian		Unknown		Total N
	N	%	N	%	N	%	N	%	N	%	
1975	2 190	71	854	28	32	1					3 076
1976	2 335	68	1 072	31	27	1					3 434
1977	2 351	69	1 039	30	33	1					3 423
1978	2 245	67	1 090	32	32	1					3 367
1979	2 118	66	1 026	33	45	1					3 189
1980	2 338	64	1 274	35	46	1					3 658
1981	2 209	66	1 117	33	33	1					3 359
1982	2 312	63	1 302	36	44	1			1		3 659
1983	2 096	65	1 109	34	41	1					3 246
1984	1 966	64	1 098	36	28	1					3 092
1985	2 275	64	1 200	34	66	2					3 541
1986	2 456	68	1 125	31	45	1					3 626
1987	2 594	68	1 168	30	78	2					3 840
1988	2 518	67	1 165	31	77	2					3 760
1989	2 138	65	1 090	33	60	2					3 288
1990	2 172	64	1 155	34	51	2					3 378
1991	2 143	65	1 080	33	66	2					3 289
1992	2 144	66	1 049	32	70	2					3 263
1993	1 863	65	956	33	65	2					2 884
1994	1 737	61	1 021	36	94	3					2 852
1995	2 830	71	1 059	27	99	2			12	0.3	4 003
1996	2 154	67	960	30	56	2			69	2.1	3 239
1997	2 223	69	897	28	70	2			18	0.6	3 208
1998	1 977	69	836	29	49	2	1		17	0.6	2 880
1999	1 656	65	832	33	29	1			12	0.5	2 529
2000	1 798	69	761	29	41	2			8	0.3	2 608
2001	1 690	67	813	32	13	1			13	0.5	2 529
2002	1 677	67	763	30	50	2			28	1.1	2 518
2003	1 536	66	745	32	23	1	1		13	0.6	2 318
2004	1 428	69	596	29	22	1	1		8	0.4	2 055
2005	1 274	68	562	30	22	1			18	1.0	1 876
2006	1 165	68	535	31	11	1			9	0.5	1 720
2007	1 144	66	539	31	21	1			20	1.2	1 724
2008	1 185	69	556	32	11	1			48	2.7	1 800
2009	1 138	68	500	29	16	1			8	0.5	1 662
2010	960	64	521	35	15	1			6	0.4	1 502
<b>Total</b>	70 035	66	33 468	32	1 581	2	3		307	0.3	105 395

It is important to note that a referral bias exists: there is a low autopsy rate for black men who have left employment at the mines, whereas the majority of white retired miners come to autopsy. The numbers of miners coming to autopsy has decreased steadily over the years, probably reflecting the concomitant decrease in the number of miners. In 1994, there were around 344 000 people employed in the gold mining industry compared to approximately 166 088 in 2010.

The pathologists at the NIOH perform two types of autopsy examinations. For men dying distant from Johannesburg, the cardio-respiratory organs are removed locally, preserved in formalin and sent to the NIOH. Full autopsies are undertaken on men who die close to Johannesburg.

Table 2-2 shows the distribution of autopsies by population group for 2010. Autopsies of only the cardio-respiratory organs comprised 97.9% of all examinations.

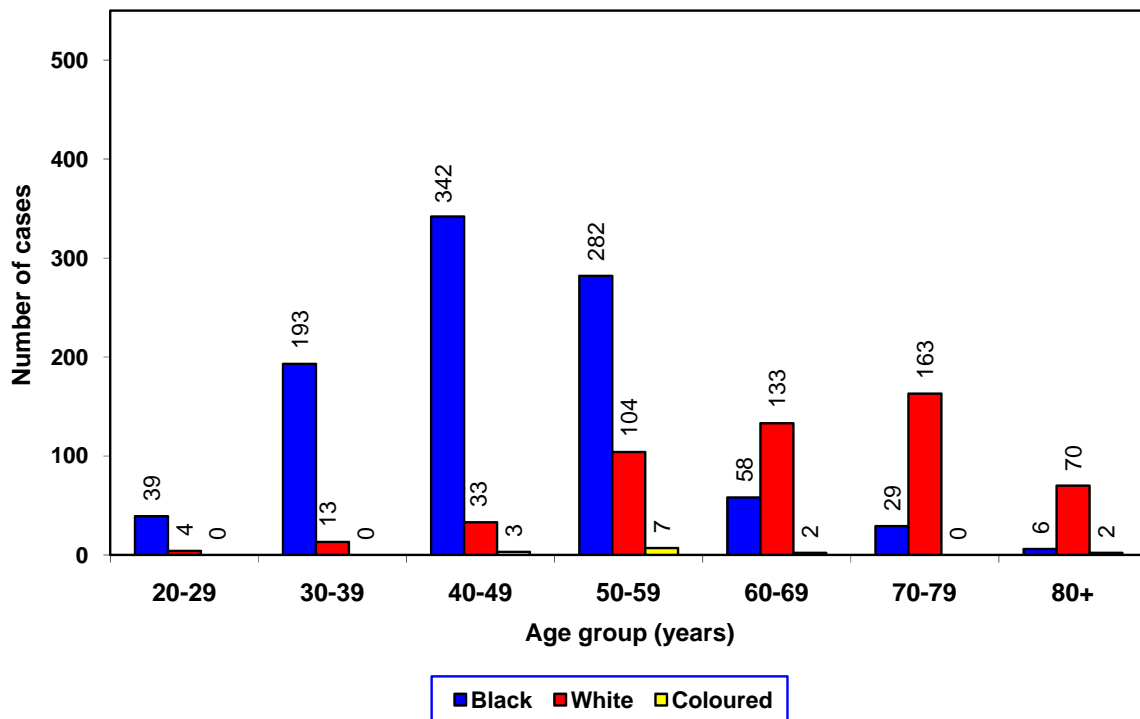
**TABLE 2-2 NUMBER AND PROPORTION OF AUTOPSIES BY TYPE AND POPULATION GROUP (2010)**

Autopsy type	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
Cardio-respiratory organs only	960	100.0	491	94.2	14	93.3	6	100.0	1 471	97.9
Full autopsy	0	-	30	5.8	1	6.7	0	-	31	2.1
Total	960		521		15		6		1 502	

The age distribution of cases for 2010 is shown in Table 2-3 and Figure 2-1. The mean age at autopsy of black men was 46.4 years, similar to that in 2009 (46.6 years). The mean age of white men at autopsy increased from 64.5 years in 2009 to 66.0 years in 2010.

**TABLE 2-3 NUMBER AND PROPORTION OF AUTOPSIES BY AGE AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
20-29	39	4.1	4	0.8	0	-	0	-	43	2.9
30-39	193	20.1	13	2.5	0	-	0	-	206	13.7
40-49	342	35.6	33	6.3	3	20.0	0	-	378	25.2
50-59	282	29.4	104	20.0	7	46.7	0	-	393	26.2
60-69	58	6.0	133	25.5	2	13.3	0	-	193	12.8
70-79	29	3.0	163	31.3	0	-	0	-	192	12.8
80+	6	0.6	70	13.4	2	13.3	0	-	78	5.2
Unknown	11	1.1	1	0.2	1	6.7	6	100.0	19	1.3
Total	960		521		15		6		1 502	



**FIG 2-1 DISTRIBUTION OF AUTOPSIES BY AGE AND POPULATION GROUP (2010)**

Cases were placed in categories according to the commodity in which they had worked for the longest duration (most exposure). Many men, however, worked in a number of different mining commodities during their lifetimes and had “mixed” exposures. This was not taken into account in the analysis of exposure type (commodity).

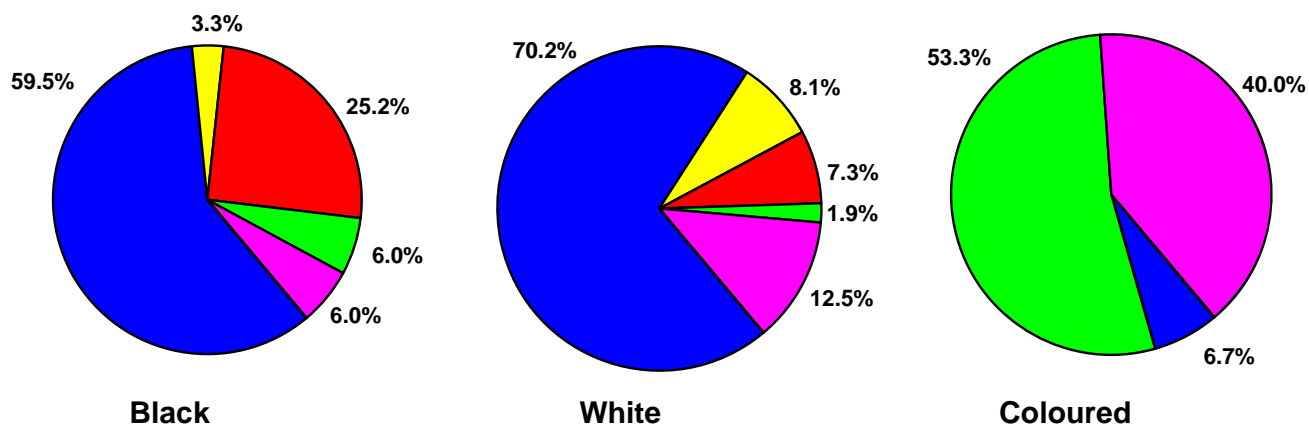
In 2006, a new category called ‘environmental asbestos’ exposure was introduced on the database. Cases with this exposure have been grouped under ‘other’ exposure for analyses and in 2010 comprise two cases in whites, two in coloureds and four in blacks.

Table 2-4 and Figure 2-2 show the distributions of autopsies by commodity and population group for 2010. Of the cases received, 62.5% were from the gold mining industry compared to 66.7% in 2009. The proportion of autopsies from the platinum industry has increased over the years, from 8.3% in 1999 to 18.8% in 2010. As in previous years, most of the coloured cases autopsied had been exposed to asbestos: 8 (53.3%) in the asbestos mines and 2 (13.3%) in the environment.

**TABLE 2-4 NUMBER AND PROPORTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (2010)**

Commodity	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
Gold	571	59.5	366	70.2	1	6.7	0	-	938	62.5
Platinum	242	25.2	38	7.3	0	-	3	50.0	283	18.8
Coal	32	3.3	42	8.1	0	-	0	-	74	4.9
Asbestos	58	6.0	10	1.9	8	53.3	0	-	76	5.1
Iscor	2	0.2	18	3.5	0	-	0	-	20	1.3
Diamond	6	0.6	7	1.3	0	-	0	-	13	0.9
Copper	1	0.1	7	1.3	1	6.7	0	-	9	0.6
Manganese	13	1.4	2	0.4	1	6.7	0	-	16	1.1
Industry	3	0.3	11	2.1	1	6.7	0	-	15	1.0
Other	14	1.5	14	2.7	2	13.3	0	-	30	2.0
Unknown	18	1.9	6	1.2	1	6.7	3	50.0	28	1.9
<b>Total</b>	<b>960</b>		<b>521</b>		<b>15</b>		<b>6</b>		<b>1 502</b>	

Note: this table shows only those commodities where a total of 9 or more cases were received



Gold	Coal	Platinum	Asbestos	Other*
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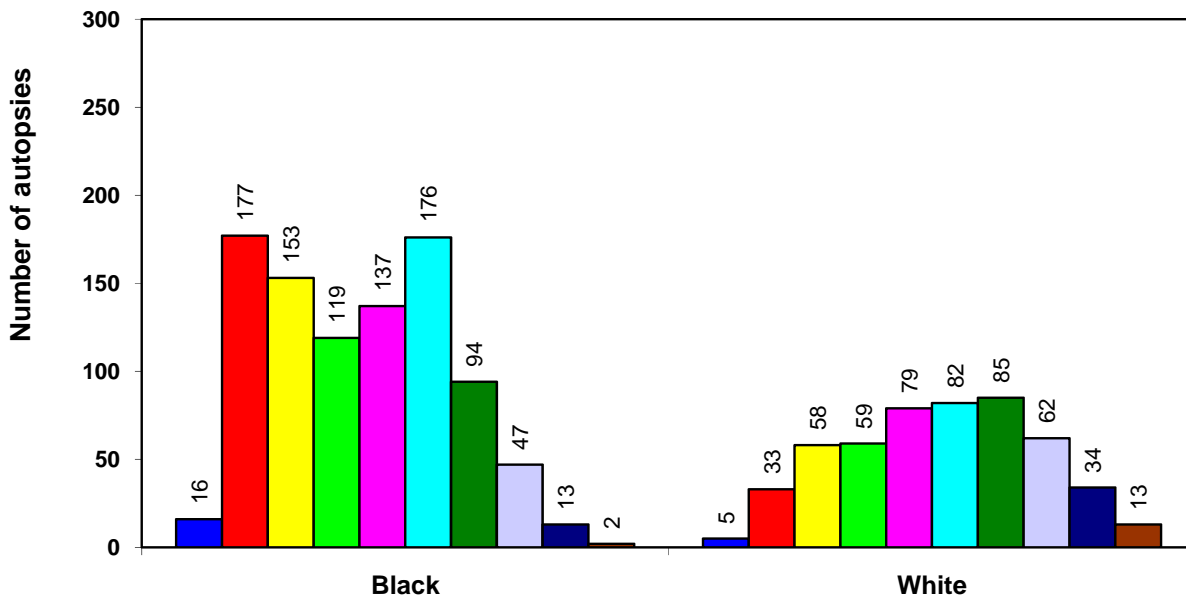
\* Includes copper, diamond, environmental asbestos, Eskom, industry, iron, Iscor, lime, manganese, phosphate, quarry, railways, silica, steel, vanadium, zinc as well as cases where service histories could not be obtained

**FIG 2-2 DISTRIBUTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (2010)**

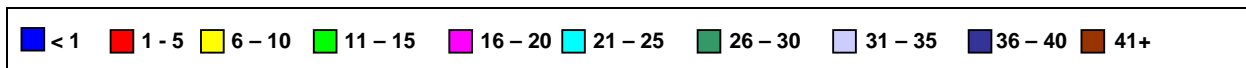
Detailed information about the years in mining service by population group is presented in Table 2-5 and Figure 2-3. In 2010, the duration of service was obtained for all but 3.1% of the cases. This figure is lower than that for 2009 (3.7%).

**TABLE 2-5 NUMBER AND PROPORTION OF AUTOPSIES BY YEARS OF SERVICE AND POPULATION GROUP (2010)**

Years of service	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
<1	16	1.7	5	1.0	0	-	0	-	21	1.4
1-5	177	18.4	33	6.3	4	26.7	0	-	214	14.2
6-10	153	15.9	58	11.1	3	20.0	0	-	214	14.2
11-15	119	12.4	59	11.3	1	6.7	0	-	179	11.9
16-20	137	14.3	79	15.2	2	13.3	0	-	218	14.5
21-25	176	18.3	82	15.7	1	6.7	0	-	259	17.2
26-30	94	9.8	85	16.3	0	-	0	-	179	11.9
31-35	47	4.9	62	11.9	1	6.7	0	-	110	7.3
36-40	13	1.4	34	6.5	0	-	0	-	47	3.1
41+	2	0.2	13	2.5	0	-	0	-	15	1.0
Unknown	26	2.7	11	2.1	3	20.0	6	100	46	3.1
<b>Total</b>	<b>960</b>		<b>521</b>		<b>15</b>		<b>6</b>		<b>1 502</b>	



Years of service:



**FIG 2-3 DISTRIBUTION OF AUTOPSIES BY YEARS OF SERVICE AND POPULATION GROUP (2010)**

The mean age and duration of service by commodity and population group for those cases for which information was available are shown in Tables 2-6 and 2-7.

**TABLE 2-6 MEAN AGE BY COMMODITY AND POPULATION GROUP (2010)**

Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
Gold	569	45	9	366	67	12
Platinum	242	44	9	38	59	16
Coal	32	48	12	42	65	13
Asbestos	58	64	11	10	74	6
Iscor	2	64	13	18	73	10
Diamond	6	63	7	7	62	13
Copper	1	56	-	7	68	12
Manganese	13	58	8	2	63	5
Industry	3	58	30	11	68	10
Other	14	59	11	14	66	11
Unknown	10	50	14	5	60	9
Total	950	47	11	520	66	13

\* Standard deviation

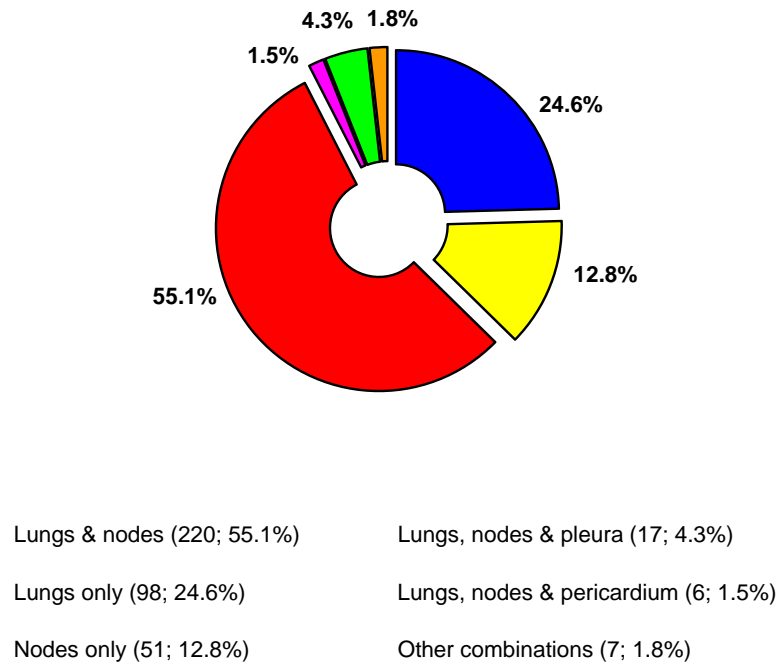
**TABLE 2-7 MEAN DURATION OF SERVICE BY COMMODITY AND POPULATION GROUP (2010)**

Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
Gold	570	17	9	364	23	10
Platinum	242	14	9	37	14	10
Coal	32	22	12	41	20	12
Asbestos	56	9	10	10	14	11
Iscor	2	10	7	18	30	7
Diamond	6	13	12	7	17	9
Copper	1	15	-	7	19	11
Manganese	13	16	8	2	19	1
Industry	3	21	20	11	21	12
Other	9	19	13	13	23	10
Total	934	16	10	510	22	11

\*Standard deviation

## SECTION 3 – ACTIVE TUBERCULOSIS

The distribution of active tuberculosis (TB) by anatomical site is presented in Figure 3-1 (n=399). Active pulmonary TB (PTB) was diagnosed in 23.1% (347) of all cases autopsied in 2010, compared to 16.4% (416) in 2000. Most of the men with PTB were black (324 cases; 93.4%), 20 cases (5.8%) were white, one case (0.3%) was coloured and for two cases (0.6%) the population group was not known.

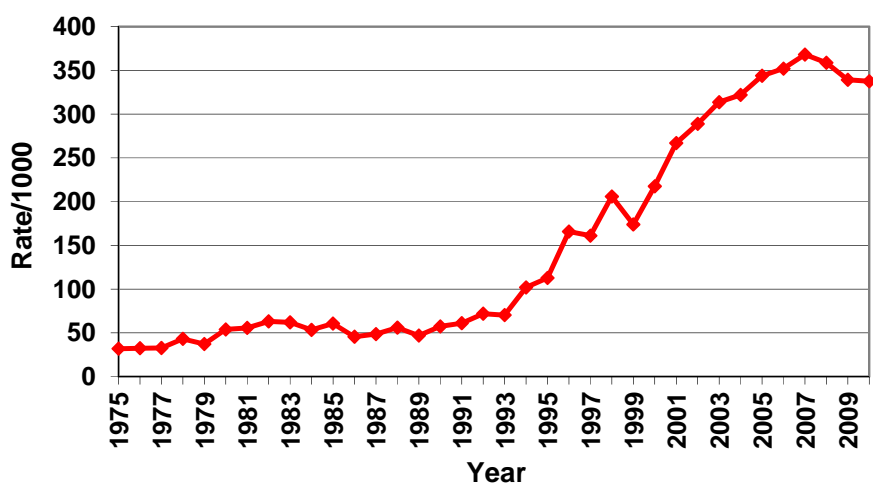


**FIG 3-1 DISTRIBUTION OF ACTIVE TB BY SITE (2010)**

The rates in subsequent tables and figures are expressed per 1000.

In 2010, the overall PTB rate was 231/1000. In black miners, PTB rates increased from the early 1990s to 2007 and have declined annually to 338/1000 in 2010 (Fig 3-2). The rate in white men remains lower than that in black men, 38/1000 in 2010.





**FIG 3-2 ACTIVE PTB RATES IN BLACK MINERS AT AUTOPSY (1975 to 2010)**

The distribution of active PTB cases by commodity is shown in Table 3-1. Most cases of the active PTB (66.9%) were from the gold (62.5% of all autopsy cases came from that commodity) and platinum (21.3%) mining industries.

**TABLE 3-1 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY COMMODITY AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Gold	219	384	13	36	0	-	0	-	232	247
Platinum	70	289	3	-	0	-	1	-	74	261
Coal	6	188	2	-	0	-	0	-	8	108
Asbestos	16	276	1	-	1	-	0	-	18	237
Iscor	1	-	0	-	0	-	0	-	1	-
Diamond	1	-	0	-	0	-	0	-	1	-
Copper	0	-	1	-	0	-	0	-	1	-
Manganese	3	-	0	-	0	-	0	-	3	-
Industry	1	-	0	-	0	-	0	-	1	-
Other	1	-	0	-	0	-	0	-	1	-
Unknown	6	636	0	-	0	-	1	-	7	250
<b>Total</b>	<b>324</b>	<b>338</b>	<b>20</b>	<b>38</b>	<b>1</b>		<b>2</b>		<b>347</b>	<b>231</b>

Note: rates have not been calculated where numbers are small



The age distribution of cases with active PTB is shown in Table 3-2. Most of the PTB cases (n=144; 41.5%) were in the age group 40-49 years, followed by those in the 50-59 year age group (n=93; 26.8%).

**TABLE 3-2 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY AGE AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
20-29	8	205	0	-	0	-	0	-	8	186
30-39	64	332	2	-	0	-	0	-	66	320
40-49	143	418	1	-	0	-	0	-	144	381
50-59	87	309	5	-	1	-	0	-	93	237
60-69	9	155	8	60	0	-	0	-	17	88
70-79	6	207	3	-	0	-	0	-	9	47
80+	0	-	1	-	0	-	0	-	1	-
Unknown	7	636	0	-	0	-	2	-	9	474
<b>Total</b>	<b>324</b>	<b>338</b>	<b>20</b>	<b>38</b>	<b>1</b>		<b>2</b>		<b>347</b>	<b>231</b>

Note: rates have not been calculated where numbers are small

## SECTION 4 – SILICOSIS

Silicotic nodules were found in the lungs of 350 cases (23.3% of all autopsies), 87.7% of which came from the gold mining industry. Of all cases of silicosis, occasional silicotic nodules were found in 149 (42.7%) of cases, a few in 75 (21.5%), a moderate number in 103 (29.5%) and a large number in 22 (6.3%).

The distribution of cases with silicosis by commodity and population group is presented in Table 4-1.

**TABLE 4-1 NUMBER OF CASES AND PREVALENCE OF SILICOSIS BY COMMODITY AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Gold	216	378	91	249	0	-	0	-	307	327
Platinum	11	45	3	-	0	-	0	-	14	49
Coal	0	-	4	-	0	-	0	-	4	-
Asbestos	5	-	0	-	0	-	0	-	5	-
Iscor	1	-	3	-	0	-	0	-	4	-
Diamond	1	-	0	-	0	-	0	-	1	-
Copper	0	-	2	-	0	-	0	-	2	-
Industry	1	-	1	-	0	-	0	-	2	-
Other	2	-	1	-	0	-	0	-	3	-
Unknown	6	333	0	-	0	-	2	-	8	28
<b>Total</b>	<b>243</b>	<b>253</b>	<b>105</b>	<b>202</b>	<b>0</b>		<b>2</b>		<b>350</b>	<b>233</b>

Note: rates have not been calculated where numbers are small

Silicosis in gold miners is shown in the following tables. The rate of silicosis in gold miners increased from 320/1000 in 2009 to 327/1000 in 2010. Although the silicosis rates increased with increasing age in both black and white men, the age distribution of cases differed between the two population groups (Table 4-2). In black men, silicosis was diagnosed among younger men (<40 years) (Table 4-2).

**TABLE 4-2 NUMBER OF CASES AND PREVALENCE OF SILICOSIS IN THE GOLD MINING INDUSTRY, BY AGE AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
30-39	8	69	0	-	0	-	0	-	8	65
40-49	94	402	1	-	0	-	0	-	95	368
50-59	103	595	14	206	0	-	0	-	117	485
60-69	8	471	28	275	0	-	0	-	36	303
70-79	2	-	32	286	0	-	0	-	34	293
80+	1	-	16	308	0	-	0	-	17	321
Total	216	378	91	249	0		0		307	327

Note: rates have not been calculated where numbers are small

**TABLE 4-3 NUMBER OF CASES AND PREVALENCE OF SILICOSIS IN THE GOLD MINING INDUSTRY, BY YEARS OF SERVICE AND POPULATION GROUP (2010)**

Years of service	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
<1	3	-	0	-	0	-	0	-	3	-
1-5	7	83	2	-	0	-	0	-	9	87
6-10	9	120	2	-	0	-	0	-	11	105
11-15	23	303	6	133	0	-	0	-	29	240
16-20	38	409	11	190	0	-	0	-	49	325
21-25	74	556	18	290	0	-	0	-	92	469
26-30	36	529	21	344	0	-	0	-	57	442
31-35	21	700	21	429	0	-	0	-	42	532
36-40	5	-	8	286	0	-	0	-	13	394
41+	0	-	1	-	0	-	0	-	1	-
Unknown	0	-	1	-	0	-	0	-	1	-
Total	216	378	91	249	0		0		307	327

Note: rates have not been calculated where numbers are small

## SECTION 5 – OTHER PNEUMOCONIOSES

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### MASSIVE FIBROSIS

There were 20 (1.3%) cases of massive fibrosis (12 black, 8 white). Fifteen were from the gold mining industry and one each was from platinum, Iscor, copper, iron and industry.

### COAL WORKERS' PNEUMOCONIOSIS

There were 6 (0.4%) cases of coal workers' pneumoconiosis. Five were from the coal and one was from the gold mining industry.

### MIXED DUST PNEUMOCONIOSIS

There were 2 (0.1%) cases of mixed dust pneumoconiosis. Both were from the gold mining industry.

### ASBESTOSIS AND PLEURAL PLAQUES

There were 68 cases of asbestosis, higher than the number in 2009 (58 cases). Of the asbestosis cases, 38.2% (n=26) had slight, 36.8% (n=25) moderate and 25.0% (n=17) marked fibrosis. Forty two (61.8%) of these cases had worked in the asbestos mining industry at some time in their lives and one had been exposed to asbestos in the environment.

There were 56 cases with asbestos plaques and of these 22 had asbestosis. However, the parietal pleura (the site where plaque formation usually occurs) is seldom submitted with the lungs.

The distribution of asbestosis by age and population group is shown in Table 5-1.

**TABLE 5-1 NUMBER OF CASES AND PREVALENCE OF ASBESTOSIS BY AGE AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
40-49	2	-	0	-	0	-	0	-	2	-
50-59	13	46	1	-	1	-	0	-	15	38
60-69	23	397	1	-	0	-	0	-	24	124
70-79	15	517	5	-	0	-	0	-	20	104
80+	1	-	2	-	1	-	0	-	4	-
Unknown	2	-	0	-	0	-	1	-	3	-
<b>Total</b>	<b>56</b>	<b>58</b>	<b>9</b>	<b>17</b>	<b>2</b>		<b>1</b>		<b>68</b>	<b>45</b>

Note: rates have not been calculated where numbers are small

## SECTION 6 – EMPHYSEMA

There were 375 cases of emphysema, the extent of which was mild in 76.5% (n=287), moderate in 18.4% (n=69) and marked in 5.1% (n=19). The overall rate of emphysema (250/1000) was higher than that in 2009 (239/1000). The distribution of emphysema by age and population group is presented in Table 6-1.

**TABLE 6-1 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY AGE AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
30-39	11	57	0	-	0	-	0	-	11	53
40-49	35	102	5	-	0	-	0	-	40	106
50-59	58	206	38	365	3	-	0	-	99	252
60-69	22	379	66	496	1	-	0	-	89	461
70-79	8	276	83	509	0	-	0	-	91	474
80+	2	-	37	529	1	-	0	-	40	513
Unknown	3	-	0	-	0	-	2	-	5	-
<b>Total</b>	<b>139</b>	<b>145</b>	<b>229</b>	<b>440</b>	<b>5</b>		<b>2</b>		<b>375</b>	<b>250</b>

Note: rates have not been calculated where numbers are small

Most of the black and white men with emphysema were from the gold mining industry (n=247, 65.9%) (Table 6-2).

**TABLE 6-2 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY COMMODITY AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Gold	81	142	166	454	0	-	0	-	247	263
Platinum	16	66	10	263	0	-	0	-	26	92
Coal	8	250	19	452	0	-	0	-	27	365
Asbestos	18	310	3	300	4	-	0	-	25	329
Iscor	1	-	3	-	1	-	0	-	5	-
Diamond	1	-	11	611	0	-	0	-	12	600
Copper	0	-	3	-	0	-	0	-	3	-
Manganese	3	-	0	-	0	-	0	-	3	-
Industry	1	-	6	545	0	-	0	-	7	467
Other	4	-	5	-	0	-	0	-	9	300
Unknown	6	333	3	-	0	-	2	-	11	393
<b>Total</b>	<b>139</b>	<b>145</b>	<b>229</b>	<b>440</b>	<b>5</b>		<b>2</b>		<b>375</b>	<b>250</b>

Note: rates have not been calculated where numbers are small

**TABLE 6-3 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY YEARS OF SERVICE AND POPULATION GROUP (2010)**

Years of service	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
<1	4	-	2	-	0	-	0	-	6	286
1 - 5	13	73	8	242	1	-	0	-	22	103
6-10	18	118	18	310	3	-	0	-	39	182
11-15	19	160	27	458	0	-	0	-	46	257
16-20	17	124	33	418	1	-	0	-	51	234
21-25	32	182	38	463	0	-	0	-	70	270
26-30	18	191	45	529	0	-	0	-	63	352
31-35	6	128	32	516	0	-	0	-	38	345
36-40	3	-	15	441	0	-	0	-	18	383
41+	0	-	7	538	0	-	0	-	7	467
Unknown	9	346	4	364	0	-	2	-	15	326
Total	139	145	229	440	5		2		375	250

Note: rates have not been calculated where numbers are small

## SECTION 7 – MESOTHELIOMA

There were 31 of cases of mesothelioma in 2010.

**TABLE 7-1 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY AGE AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
40-49	3	15.8	0	-	0	-	0	-	3	9.7
50-59	3	15.8	2	15.4	0	-	0	-	5	16.1
60-69	8	42.1	2	15.4	0	-	0	-	10	32.3
70-79	5	26.3	5	38.5	0	-	0	-	10	32.3
80+	0	-	2	15.4	1	100.0	0	-	3	9.7
Total	19		11		1		0		31	

The distribution of mesothelioma by commodity and population group is presented in Table 7.2. Seventeen (54.8%) of the cases had worked in asbestos mines at some stage in their careers and four had been exposed to asbestos in the environment.

**TABLE 7-2 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY COMMODITY AND POPULATION GROUP (2010)**

Commodity	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
Asbestos	6	31.6	1	9.1	1	100.0	0	-	8	25.8
Gold	0	-	2	18.2	0	-	0	-	2	6.5
Platinum	3	15.8	0	-	0	-	0	-	3	9.7
Coal	1	5.3	0	-	0	-	0	-	1	3.2
Iskor	0	-	1	9.1	0	-	0	-	1	3.2
Diamond	1	5.3	0	-	0	-	0	-	1	3.2
Manganese	4	21.1	0	-	0	-	0	-	4	12.9
Industry	0	-	1	9.1	0	-	0	-	1	3.2
Other	4	21.1	5	45.5	0	-	0	-	9	29.0
Unknown	0	-	1	9.1	0	-	0	-	1	3.2
Total	19		11		1		0		31	

## SECTION 8 – PRIMARY LUNG CANCER

Sixty five cases of primary lung cancer were found at autopsy, 27.7% of which were in black, 69.2% in white and 3.1% in coloured men. Most of the cases were adenocarcinomas (n = 22; 33.8%), followed by large cell lung carcinomas (n = 19; 29.2%), squamous cell lung carcinomas (n = 16; 24.6%) and small cell lung carcinomas (n = 8; 12.3%).

The distribution of primary lung cancer by age and population group is presented in Table 8-1.

**TABLE 8-1 NUMBER OF CASES AND PREVALENCE OF PRIMARY LUNG CANCER BY AGE AND POPULATION GROUP (2010)**

Commodity	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
30-39	1	-	0	-	0	-	0	-	1	-
40-49	4	-	1	-	0	-	0	-	5	-
50-59	9	32	4	-	0	-	0	-	13	33
60-69	2	-	10	75	1	-	0	-	13	67
70-79	0	-	24	147	0	-	0	-	24	125
80+	2	-	6	86	0	-	0	-	8	103
Unknown	0	-	0	-	1	-	0	-	1	-
<b>Total</b>	<b>18</b>	<b>19</b>	<b>45</b>	<b>86</b>	<b>2</b>		<b>0</b>		<b>65</b>	<b>43</b>

Note: rates have not been calculated where numbers are small

The distribution of primary lung cancer by commodity and population group is presented in Table 8-2. The majority of cases came from the gold mining industry.

**TABLE 8-2 NUMBER OF CASES AND PREVALENCE OF PRIMARY LUNG CANCER BY COMMODITY AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Gold	6	11	29	79	0	-	0	-	35	37
Platinum	3	-	2	-	0	-	0	-	5	-
Coal	1	-	2	-	0	-	0	-	3	-
Asbestos	6	103	5	-	0	-	0	-	11	145
Iscor	1	-	4	-	0	-	0	-	5	-
Copper	0	-	0	-	1	-	0	-	1	-
Industry	1	-	2	-	0	-	0	-	3	-
Other	0	-	1	-	0	-	0	-	1	-
Unknown	0	-	0	-	1	-	0	-	1	-
<b>Total</b>	<b>18</b>	<b>19</b>	<b>45</b>	<b>86</b>	<b>2</b>		<b>0</b>		<b>65</b>	<b>43</b>

Note: rates have not been calculated where numbers are small

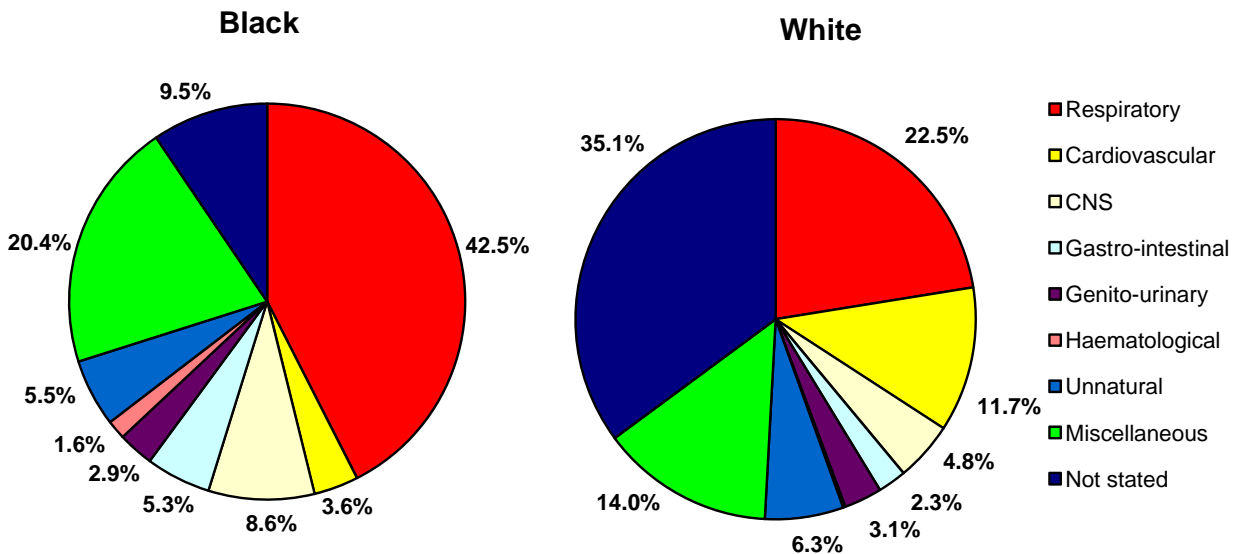


## SECTION 9 – CLINICAL CAUSE OF DEATH

Table 9-1 and Figure 9-1 show the clinical cause of death as stated in the accompanying documents submitted with the cardio-respiratory organs, by population group. Diseases of the respiratory system were the most frequent (35.4% overall). The proportion of unnatural deaths decreased from 6.9% in 2009 to 5.7% in 2010. The clinical cause of death was not stated in 18.9% of cases.

**TABLE 9-1 CLINICAL CAUSE OF DEATH BY POPULATION GROUP (2010)**

System	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
Respiratory	408	42.5	117	22.5	6	40.0	0	-	531	35.4
Cardio-vascular	35	3.6	61	11.7	2	13.3	0	-	98	6.5
Central Nervous System	83	8.6	25	4.8	0	-	0	-	108	7.2
Gastro-intestinal	51	5.3	12	2.3	0	-	0	-	63	4.2
Genito-urinary	28	2.9	16	3.1	0	-	0	-	44	2.9
Haematological	15	1.6	1	0.2	0	-	0	-	16	1.1
Unnatural	53	5.5	33	6.3	0	-	0	-	86	5.7
Miscellaneous	196	20.4	73	14.0	3	20.0	0	-	272	18.1
Not stated	91	9.5	183	35.1	4	26.7	6	100.0	284	18.9
<b>Total</b>	<b>960</b>		<b>521</b>		<b>15</b>		<b>6</b>		<b>1 502</b>	



**FIGURE 9-1 CLINICAL CAUSE OF DEATH (2010)**

## SECTION 10 – AUTOPSY FINDINGS IN WOMEN

Of the 1 502 cases examined in 2010, 32 (2.1%) were women, compared to 24 (1.4%) in 2009. Of these, 25 (78.1%) were black, 2 (6.3%) were white and 5 (15.6%) were coloured. The women were, on average, younger than the men (51.5 years versus 53.3 years).

**TABLE 10.1 NUMBER AND PROPORTION OF AUTOPSIES IN WOMEN BY AGE AND POPULATION GROUP (2010)**

Age group (years)	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
20-29	3	12.0	0	-	0	-	3	9.4
30-39	6	24.0	1	50.0	0	-	7	21.9
40-49	3	12.0	0	-	1	20.0	4	12.5
50-59	6	24.0	1	50.0	2	40.0	9	28.1
60-69	3	12.0	0	-	1	20.0	4	12.5
70-79	2	8.0	0	-	0	-	2	6.3
80+	2	8.0	0	-	1	20.0	3	9.4
Total	25		2		5		32	

Table 10.2 summarises the distribution of autopsies in women by commodity and population group. Most of the women (18 cases; 56.3%) had been exposed to asbestos, with 12 (66.7%) of these exposed on the mines and 5 (33.3%) having had environmental exposure.

**TABLE 10.2 NUMBER AND PROPORTION OF AUTOPSIES IN WOMEN BY COMMODITY AND POPULATION GROUP (2010)**

Commodity	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Gold	7	28.0	0	-	0	-	7	21.9
Platinum	4	16.0	0	-	0	-	4	12.5
Coal	1	4.0	1	50.0	0	-	2	6.3
Asbestos	9	36.0	0	-	3	60.0	12	37.5
Environmental asbestos	4	16.0	0	-	2	40.0	6	18.8
Unknown	0	-	1	50.0	0	-	1	3.1
Total	25		2		5		32	

There were 4 cases of asbestosis and 4 of mesothelioma (Table 10.3).

**TABLE 10.3 NUMBER AND PROPORTION OF DISEASES IN WOMEN (2010)**

<b>Disease</b>	<b>N</b>	<b>%</b>
PTB	5	15.6
Silicosis	1	3.1
Emphysema	6	18.8
Asbestosis	4	12.5
Mesothelioma	4	12.5
Lung cancer	2	6.3
No lung disease	10	31.3
Total	32	

**APPENDIX 1: DISTRIBUTION OF AUTOPSIES ACCORDING TO THE LAST MINE WHERE THE DECEASED WORKED (2010)**

<b>Commodity</b>	<b>Last mine worked</b>	<b>Black</b>	<b>White</b>	<b>Coloured</b>	<b>Unknown</b>	<b>Total</b>
<b>Asbestos</b>	Asbestos Mine	2				2
	Black Rock Asbestos Mine	1				1
	Bretby Asbestos			1		1
	Cape Blue	8	1	1		10
	Everite	1				1
	Gefco	38	4	2		44
	Havelock Asbestos Mine		1			1
	Kalkkloof Asbestos Mine		1			1
	Koegas		1	4		5
	Penge Asbestos		1			1
	Pomfret Asbestos Mine	4				4
	Wandrag Asbestos Mine	2				2
<b>Total from asbestos mines</b>		<b>56</b>	<b>9</b>	<b>8</b>	<b>0</b>	<b>73</b>
<b>Chrome</b>	Chrome Mine	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>Coal</b>	Amcoal Colliery	1				1
	Arnot Colliery	1				1
	Bank Colliery		1			1
	Coal Mine		1			1
	Delmas Colliery		1			1
	Douglas Colliery		2			2
	Ermelo Coal		1			1
	Gloria Colliery		1			1
	Goedehoop Colliery	5				5
	Greenside Colliery	4	4			8
	Kleinkopje Colliery	1				1
	Kriel Colliery		1			1
	Landau Colliery	1				1
	Matla Coal	14	3			17
	Middleburg Colliery		1			1
	Natal Anthracite Colliery	1	2			3
	New Clydesdale Colliery	2	1			3
	New Denmark		1			1
	New Largo Colliery		1			1
	Optimum Colliery		2			2
	Phoenix Colliery		1			1
	Rietspruit Colliery		1			1
	S A Coal Estates		2			2
	Sasol Coal Mine		1			1
	Savemore Colliery		1			1

Commodity	Last mine worked	Black	White	Coloured	Unknown	Total	
Coal (continued)	Secunda Colliery		2			2	
	Spitzkop Colliery		1			1	
	Springlake Colliery		1			1	
	Tavistock Colliery		1			1	
	Tweefontein Coal Mine		1			1	
	Union Coal Mine		1			1	
	Usutu Colliery		1			1	
	Vierfontein Colliery		2			2	
	Vryheid Coronation Colliery		2			2	
	Welgedacht		1			1	
	<b>Total from coal mines</b>		<b>30</b>	<b>42</b>	<b>0</b>	<b>0</b>	<b>72</b>
	<b>Copper</b>	Copper Mine	1	1			2
O'Kiep Copper			4	1		5	
Phalaborwa			1			1	
<b>Total from copper mines</b>		<b>1</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>8</b>	
<b>Diamond</b>	De Beers Consolidated	1	3			4	
	Diamond Mine		1			1	
	Finch Diamond Mine		1			1	
	Premier Diamond		1			1	
	<b>Total from diamond mines</b>		<b>1</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>7</b>
<b>Gold</b>	Anglogold Ashanti GM	1	2			3	
	Anglogold Vaal River Operation		1			1	
	Barberton GM		1			1	
	Beatrix GM	52	4	1		57	
	Beisa GM		1			1	
	Blyvooruitzicht	1	8			9	
	Burnstone GM	1				1	
	Bracken Mines	2	1			3	
	Buffelsfontein Gold	2	13			15	
	Crown Mines		1			1	
	Daggafontein		2			2	
	Deelkraal		2			2	
	Doornfontein		6			6	
	Driefontein Consolidated GM	18	9			27	
	Durban Roodepoort Deep	3	6			9	
	East Driefontein	2	6			8	
	East Geduld		1			1	
	East Rand Prop	1	7			8	

Commodity	Last mine worked	Black	White	Coloured	Unknown	Total
Gold (continued)	Elandsrand		10			10
	Evander GM	10	1			11
	Ezulwini GM	12	1			13
	Freddies Gold	1	1			2
	Free State Geduld	1	15			16
	Free State Saaiplaas		4			4
	Gencor	5				5
	Goldfields	1	1			2
	Grootvlei Prop		5			5
	Harmony	256	24			280
	Hartebeesfontein	4	15			19
	J.C.I. Gold Mine	1				1
	Joel	1	3			4
	Kinross	2	1			3
	Kloof	22	10			32
	Kopanong GM	6	1			7
	Leeudoorn	1	2			3
	Leslie		1			1
	Libanon		5			5
	Lorraine		3			3
	Masimong GM		2			2
	Osprey GM		1			1
	Oryx	11				11
	Pamodzi GM		1			1
	President Brand		4			4
	President Steyn	3	8			11
	Protec GM		1			1
	Rand Uranium GM	4				4
	Randfontein	3	15			18
	Robinson GM		1			1
	S A Land		1			1
	Sallies	1	3			4
	Simmer & Jack GM	22	1			23
	South Deep GM	1	4			5
	South Roodepoort	1	2			3
	St Helena	1	5			6
	State GM		1			1
	Stilfontein		10			10

<b>Commodity</b>	<b>Last mine worked</b>	<b>Black</b>	<b>White</b>	<b>Coloured</b>	<b>Unknown</b>	<b>Total</b>
Gold (continued)	Sub Nigel		2			2
	Target Gold Mine		1			1
	Tshepone GM	4				4
	Ubuntu Small Scale GM	1	1			2
	Vaal Reefs	82	40			122
	Venterspost	1	4			5
	Vlakfontein		1			1
	Welkom GM	1	1			2
	West Driefontein		12			12
	West Rand Consolidated		3			3
	Western Areas	1	7			8
	Western Deep Levels	3	16			19
	Western Holdings	1	13			14
	Winkelhaak		2			2
<b>Total from gold mines</b>		<b>547</b>	<b>337</b>	<b>1</b>	<b>0</b>	<b>885</b>
<b>Iron</b>	Boshoek Iron Mine		1			1
	Iron Ore Mine	3				3
<b>Lime</b>	Union Lime	2				2
<b>Minerals</b>	Pegmin Property Ltd		1			1
<b>Manganese</b>	Associated Manganese	5	1	1		7
	S A Manganese	4	2			6
	Manganese Mine	4				4
	Hotazel Manganese Mine	3	1			4
<b>Total from manganese mines</b>		<b>16</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>21</b>
<b>Platinum</b>	Amandelbult Platinum (Rustenburg)	4				4
	Anglo Platinum Mine		1			1
	Eastern Platinum Mine	17				17
	Impala Platinum	130	20			150
	Impala Platinum Refinery		1			1
	Karee Platinum	25	1			26
	Lonmin Platinum	16	3			19
	Northam Platinum	16	3		3	22
	Rustenburg Platinum	26	26			52
	Swartklip Platinum	1				1
	Two Rivers Platinum		1			1
	Unknown Platinum		2			2
	Union Platinum	1				1

<b>Commodity</b>	<b>Last mine worked</b>	<b>Black</b>	<b>White</b>	<b>Coloured</b>	<b>Unknown</b>	<b>Total</b>
Platinum (continued)	Waternat Platinum		1			1
	Western Platinum	31	3			34
<b>Total from platinum mines</b>		<b>267</b>	<b>62</b>	<b>0</b>	<b>3</b>	<b>332</b>
<b>Quarries</b>	Hippo Quarries		1			1
	Stone Allied Crushers	1				1
<b>Silicon</b>	Silicon Smelters	3	1			4
<b>Steel &amp; Iron</b>	Iscor	5	19			24
	Transvaal Alloys Pty Ltd		1			1
<b>Steel &amp; Vanadium</b>	Highveld		3			3
	Middleburg Steel and Alloys		1			1
<b>Vanadium</b>	Rand Carbide Vanadium Mine	1				1
<b>Zinc</b>	Pering Zinc Mine		1			1
<b>Non-Miner</b>	Environmental asbestos	4	2	2		8
	Eskom	1	2			3
	Industry	2	11	1		14
	Spoornet		1			1
<b>Total for non-miners</b>		<b>7</b>	<b>16</b>	<b>3</b>	<b>0</b>	<b>26</b>
<b>Unknown</b>	Unknown	20	9	1	3	33
<b>TOTAL</b>		<b>960</b>	<b>521</b>	<b>15</b>	<b>6</b>	<b>1 502</b>



## **APPENDIX 2: PUBLICATIONS AND ACTIVITIES EMANATING FROM PATHAUT DATA OR AUTOPSY SERVICE (2010)**

### **Journal articles**

Lynn JR, *Murray J*, Shearer S, Sonnenberg P. Tuberculosis and survival of HIV-infected individuals by time since seroconversion. *AIDS* 2010; 24: 1067-9.

*Nelson G*, Girder-Brown B, *Ndlovu N*, *Murray J*. Three decades of silicosis: Disease trends at autopsy in South African gold miners. *Environ Health Perspectives* 2010; 118:421-426.

*Phillips JI*, Green YF, Davies JCA, *Murray J*. Pulmonary and systemic toxicity following exposure to nickel nanoparticles. *Am J Ind Med* 2010; 53: 763-7.

*Phillips JI*, *Murray J*. Malignant mesothelioma in a patient with anthophyllite asbestos fibres in the lungs. *Ann Occup Hyg* 2010; 54(4): 412-416.

Rees D, *Murray J*, *Nelson G*, Sonnenberg P. Oscillating migration and the epidemics of silicosis, tuberculosis, and HIV infection in South African gold miners. *Am J Ind Med* 2010; 53:398-404.

### **Reports**

*Ndlovu N*, *Murray J*, Davies JA, *Nelson G*. Pathology Division Report: Demographic data and disease rates for January-December 2009. NIOH Report 3/2010. ISSN 1812-7681. National Institute for Occupational Health, National Health Laboratory Service, South Africa, 2010.

### **Congresses**

*Nelson G*, Girdler-Brown B, *Murray J*, *Ndlovu N*. Three Decades of Silicosis: Disease Trends at Autopsy in South African Gold Miners. EpiCOH-Medichem Conference, Taipei, Taiwan, 20-25 April 2010.

Lim M, Dowdeswell R, *Murray J*, Glynn J, Sonnenberg P. The impact of HIV/AIDS and antiretroviral therapy on mortality in South African platinum miners: 1992-2008. XVIII International Aids Congress, Vienna, Austria, 18-23 July 2010.

Lim M, *Murray J*, Dowdeswell. Field N, Glynn J, Sonnenberg P. Tuberculosis and mortality in South African platinum miners, 1995-2008. XVIII International Aids Congress, Vienna, Austria, 18-23 July 2010.

Honma K, Kitagawa M, *Phillips J*. Classical asbestosis due to massive exposure to amphibole asbestos - an important subtype of asbestosis. European Respiratory Society Congress, Barcelona, Spain, 18-22 September 2010.

### **Degrees**

Gill Nelson, PhD (ongoing), School of Public Health, University of the Witwatersrand, Occupational respiratory diseases: rates, trends and risks in platinum and diamond miners coming to autopsy from 1975 to 2010.

## Outreach Programme Activities

ACTIVITY	DATE	VENUE	PERSON
Meeting with Independent Development Trust (IDT) KZN community projects officer	5 January 2010	KZN Province	Mrs J Mthombeni
Walk through of Pathology Department by Shanduka Coal Mine, Middleburg, personnel	19 January 2010	NIOH	Prof J Murray Mrs J Mthombeni Mrs E Garton
Meeting with ART to discuss radio broadcasts	21 January 2010	Ulwazi Radio, Braamfontein	Mrs N Ndlovu
Health Systems Trust Symposium	25 January 2010	East London	Prof J Murray Mrs J Mthombeni Mrs N Ndlovu
Walk through of Pathology Department by Wits Occupational Health Nursing students	1 February 2010	NIOH	Dr J Phillips Mrs J Mthombeni Ms E Garton
NUM Planning Meeting.	4 February 2010	NUM Head Office Johannesburg	Mrs N Ndlovu Mrs J Mthombeni
Meeting with ART to discuss autopsy compensation media broadcasts.	5 February 2010	ART, Johannesburg	Mrs N Ndlovu
Meeting with Oncologist, Kimberly Hospital	9 March 2010	Kimberley	Prof J Murray Ms G Nelson
Meetings with medical personnel, undertakers, mayor, forensic services and training of prosectors	8 -11 March 2010	Northern Cape - Hotazel, Vryburg, Kimberley, Kuruman and Postmasburg	Prof J Murray Ms G Nelson Mrs J Mthombeni
Meeting with NUM Health and Safety Unit Head re areas of cooperation	18 March 2010	NIOH	Prof J Murray Ms G Nelson Mrs N Ndlovu
Meeting with pathologists to discuss qualification for mortuary assistants (prosectors)	25 March 2010	Pretoria, National Department of Health	Mrs J Mthombeni Prof J Murray
25 live radio broadcasts on 5 community stations arranged by the Asbestos Relief Trust re autopsy compensation	15 - 26 March 2010	NIOH	Mrs N Ndlovu  Mrs J Mthombeni

<b>ACTIVITY</b>	<b>DATE</b>	<b>VENUE</b>	<b>PERSON</b>
Visits to undertakers	30-31 March 2010	Orkney and Klerksdorp	Mrs J Mthombeni
Presentation to NUM Health and Safety officers re autopsy compensation	29 April 2010	Carletonville	Mrs J Mthombeni
Meeting with Director, MBOD	19 May 2010	MBOD, Johannesburg	Mrs N Ndlovu Mrs J Mthombeni
Presentation at DMR silicosis workshop	21 May 2010	Cape Town	Mrs N Ndlovu
Presented to medical personnel re autopsy compensation	23 June 2010	Westvaal Hospital	Mrs J Mthombeni
3 ART radio broadcasts re autopsy compensation	19-20 July 2010	NIOH	Mrs J Mthombeni Mrs N Ndlovu Mr P Masilo
2nd quarterly meeting of the Compensation Working Group	29 July 2010	NUM Head Office, JHB	Mrs N Ndlovu Mrs J Mthombeni
Meeting with General Secretary, Swaziland Migrant Mineworkers Association re autopsies for deceased miners in Swaziland	2 September 2010	NIOH	Mrs N Ndlovu Mrs J Mthombeni
Joint NIOH/MBOD workshop at Driefontein Mine re autopsy compensation for NUM mine hostel committees	13 November 2010	Carletonville	Mrs J Mthombeni Ms J Buthelezi