



**NATIONAL HEALTH  
LABORATORY SERVICE**

NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH

---

## **Pathology Division Surveillance Report**

### **Demographic Data and Disease Rates for January to December 1982**

**Ntombizodwa Ndlovu**

**Tony Davies**

**Gill Nelson**

**Jill Murray**

*PO Box 4788  
Johannesburg  
2000*

*e-mail: [jill.murray@nioh.nhls.ac.za](mailto:jill.murray@nioh.nhls.ac.za)*

**NIOH Report 15/2011**

[http://www.nioh.ac.za/publications/publications\\_pathaut\\_reports.htm](http://www.nioh.ac.za/publications/publications_pathaut_reports.htm)

## **ACKNOWLEDGEMENTS**

*We thank all the staff members of the NIOH Pathology Department, for their invaluable contribution to the autopsy service.*

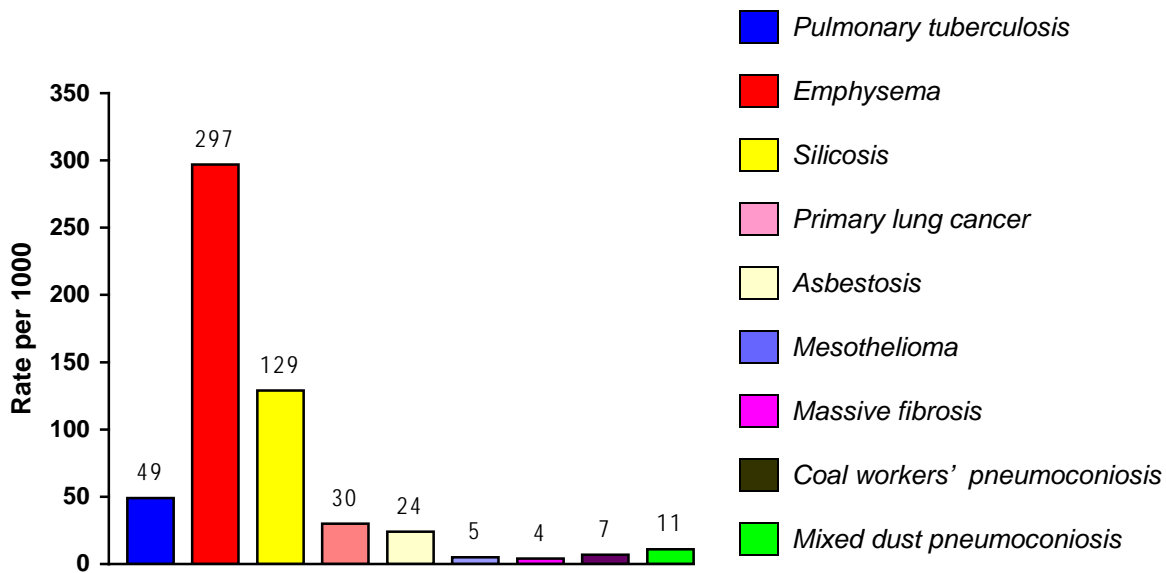
*We also thank Lizet Vermaak for collating and Prof Tony Davies for editing the manuscript.*

## EXECUTIVE SUMMARY

---

During 1982, 3 659 cases came to autopsy at the NIOH. Of these, 63.2% were black men, 35.6% were white and 1.2% were coloured. In one case the population group was not stated.

Overall disease rates (per 1 000 autopsies) for 1982 are shown in Figure 1.



**FIG 1 OVERALL DISEASE RATES FOR 1982**

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<i>i</i>
<b>GLOSSARY</b>	<i>iv</i>
<b>SECTION 1: BACKGROUND</b>	1
<b>SECTION 2: DEMOGRAPHIC DATA</b>	2
<b>SECTION 3: ACTIVE TUBERCULOSIS</b>	7
<b>SECTION 4: SILICOSIS</b>	9
<b>SECTION 5: OTHER PNEUMOCONIOSES</b>	
<i>Massive Fibrosis</i>	11
<i>Coal Workers' Pneumoconiosis</i>	11
<i>Mixed Dust Pneumoconiosis</i>	11
<i>Asbestosis and pleural plaques</i>	11
<b>SECTION 6: EMPHYSEMA</b>	12
<b>SECTION 7: MESOTHELIOMA</b>	14
<b>SECTION 8: PRIMARY LUNG CANCER</b>	15
<b>SECTION 9: CLINICAL CAUSES OF DEATH</b>	16

## LIST OF TABLES

<b>Table 2.1</b>	<i>Distribution of autopsies by year and population group (1982)</i>	2
<b>Table 2.2</b>	<i>Number and proportion of autopsies by type and population group (1982)</i>	2
<b>Table 2.3</b>	<i>Number and proportion of autopsies by age and population group (1982)</i>	3
<b>Table 2.4</b>	<i>Number and proportion of autopsies by commodity and population group (1982)</i>	4
<b>Table 2.5</b>	<i>Number and proportion of autopsies by years of service and population group (1982)</i>	5
<b>Table 2.6</b>	<i>Mean age by commodity and population group (1982)</i>	6
<b>Table 2.7</b>	<i>Mean duration of service by commodity and population group (1982)</i>	6
<b>Table 3.1</b>	<i>Number of cases and prevalence of active PTB by commodity and population group (1982)</i>	8
<b>Table 3.2</b>	<i>Number of cases and prevalence of active PTB by age and population group (1982)</i>	8
<b>Table 4.1</b>	<i>Number of cases and prevalence of silicosis by commodity and population group (1982)</i>	9
<b>Table 4.2</b>	<i>Number of cases and prevalence of silicosis in the gold mining industry, by age and population group (1982)</i>	9
<b>Table 4.3</b>	<i>Number of cases and prevalence of silicosis in the gold mining industry, by years of service and population group (1982)</i>	10

<b>Table 5.1</b>	<i>Number of cases and prevalence of asbestosis by age and population group (1982)</i>	11
<b>Table 6.1</b>	<i>Number of cases and prevalence of emphysema by age and population group (1982)</i>	12
<b>Table 6.2</b>	<i>Number of cases and prevalence of emphysema by commodity and population group (1982)</i>	12
<b>Table 6.3</b>	<i>Number of cases and prevalence of emphysema by years of service and population group (1982)</i>	13
<b>Table 7.1</b>	<i>Number and proportion of mesothelioma cases by age and population group (1982)</i>	14
<b>Table 7.2</b>	<i>Number and proportion of mesothelioma cases by commodity and population group (1982)</i>	14
<b>Table 8.1</b>	<i>Number of cases and prevalence of primary lung cancer by age and population group (1982)</i>	15
<b>Table 8.2</b>	<i>Number of cases and prevalence of primary lung cancer by commodity and population group (1982)</i>	15
<b>Table 9.1</b>	<i>Clinical causes of death by population group (1982)</i>	16

## LIST OF FIGURES

<b>Figure 1</b>	<i>Overall disease rates for 1982</i>	<i>i</i>
<b>Figure 2.1</b>	<i>Distribution of autopsies by age and population group (1982)</i>	3
<b>Figure 2.2</b>	<i>Distribution of autopsies by commodity and population group (1982)</i>	4
<b>Figure 2.3</b>	<i>Distribution of autopsies by years of service and population group (1982)</i>	5
<b>Figure 3.1</b>	<i>Distribution of active TB by site (1982)</i>	7
<b>Figure 9.1</b>	<i>Clinical cause of death as given by the clinicians who submit the organs to the NIOH (1982)</i>	16

## GLOSSARY

---

<b>Asbestosis</b>	<i>Lung fibrosis caused by asbestos fibres</i>
<b>Coal workers' pneumoconiosis</b>	<i>Lung fibrosis caused by exposure to coal dust</i>
<b>Emphysema</b>	<i>Lung disease caused by the destruction of the alveolar walls</i>
<b>Massive fibrosis</b>	<i>Lung fibrosis caused by exposure to dust and measuring more than 1 cm in diameter</i>
<b>Mesothelioma</b>	<i>A malignant tumour of the pleural cavity of the lungs</i>
<b>Miner</b>	<i>A person who has worked in a controlled mine or works</i>
<b>Mixed exposures</b>	<i>The multiple dust types to which a miner may be exposed, having worked in several mining commodities in his lifetime</i>
<b>Prevalence</b>	<i>The number of cases in a defined population at a given time</i>
<b>Silicosis</b>	<i>Lung fibrosis caused by inhalation of silica dust; detected by the presence of silicotic nodules in the lung tissue</i>
<b>Surveillance</b>	<i>The ongoing and systematic collection, analysis and interpretation of data related to adverse health outcomes</i>

## 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 v9.1.*

*This report describes autopsy cases examined during the year 1982. This and other annual reports can be accessed at [www.nioh.ac.za](http://www.nioh.ac.za).*

*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.*

*All disease rates reported in this document are expressed per 1 000. 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 number of autopsies performed since 1982 is presented in Table 2-1.

**TABLE 2-1 DISTRIBUTION OF AUTOPSIES BY YEAR AND POPULATION GROUP (1975 - 1982)**

Year of autopsy	Black		White		Coloured		Unknown		Total 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
<b>Total</b>	<b>18 098</b>	<b>67</b>	<b>8 774</b>	<b>32</b>	<b>292</b>	<b>1</b>	<b>1</b>		<b>27 165</b>

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 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 1982. Autopsies of only the cardio-respiratory organs comprised 81.6% of all examinations.

**TABLE 2-2 NUMBER AND PROPORTION OF AUTOPSIES BY TYPE AND POPULATION GROUP (1982)**

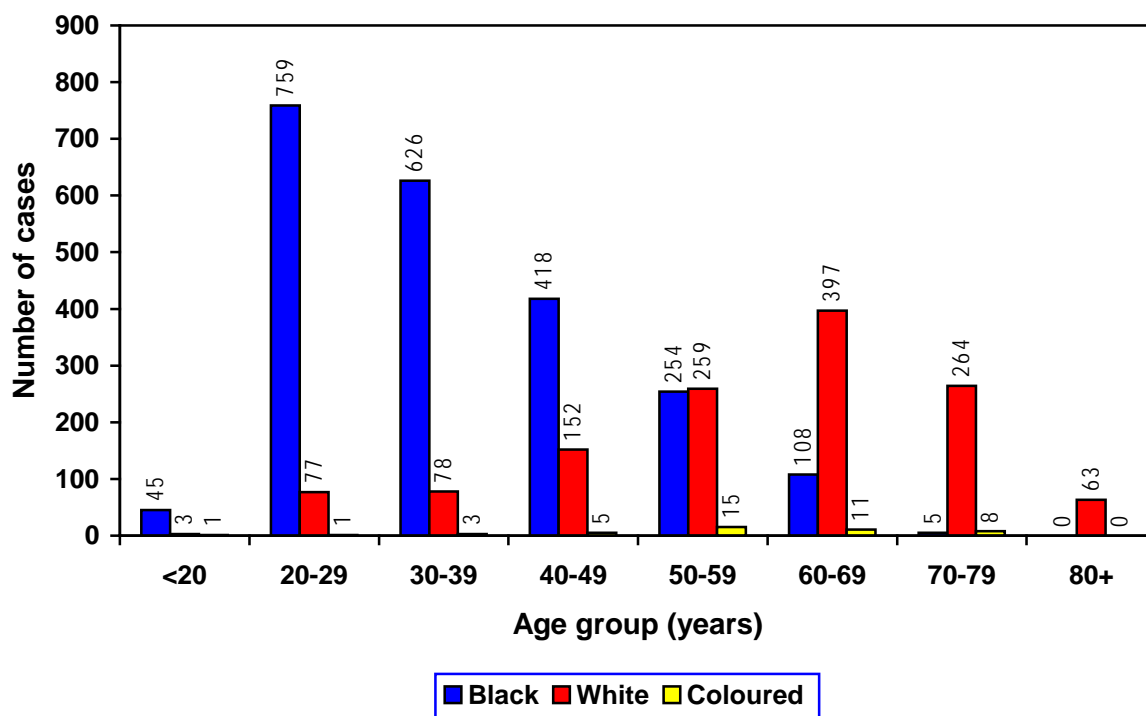
Autopsy type	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
Cardio-respiratory organs only	2 180	94.3	761	58.4	43	97.7	1	100.0	2 985	81.6
Full autopsy	131	5.7	541	41.6	1	2.3	0	-	673	18.4
Not stated	1	-	0	-	0	-	0	-	1	-
<b>Total</b>	<b>2 312</b>		<b>1 302</b>		<b>44</b>		<b>1</b>		<b>3 659</b>	



The age distribution of autopsies for 1982 is shown in Table 2-3 and Figure 2-1. The mean age at autopsy of black men was 34.4 years. The mean age of white men at autopsy was 58.5 years and for coloured men 56.3 years

**TABLE 2-3 NUMBER AND PROPORTION OF AUTOPSIES BY AGE AND POPULATION GROUP (1982)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
<20	45	1.9	3	0.2	1	2.3	0	-	49	1.3
20-29	759	32.8	77	5.9	1	2.3	0	-	837	22.9
30-39	626	27.1	78	6.0	3	6.8	0	-	707	19.3
40-49	418	18.1	152	11.7	5	11.4	0	-	575	15.7
50-59	254	11.0	259	19.9	15	34.1	0	-	528	14.4
60-69	108	4.7	397	30.5	11	25.0	0	-	516	14.1
70-79	5	0.2	264	20.3	8	18.2	0	-	277	7.6
80+	0	-	63	4.8	0	-	0	-	63	1.7
Unknown	97	4.2	9	0.7	0	-	1	100.0	107	2.9
<b>Total</b>	<b>2 312</b>		<b>1 302</b>		<b>44</b>		<b>1</b>		<b>3 659</b>	



**FIG 2-1 DISTRIBUTION OF AUTOPSIES BY AGE AND POPULATION GROUP (1982)**

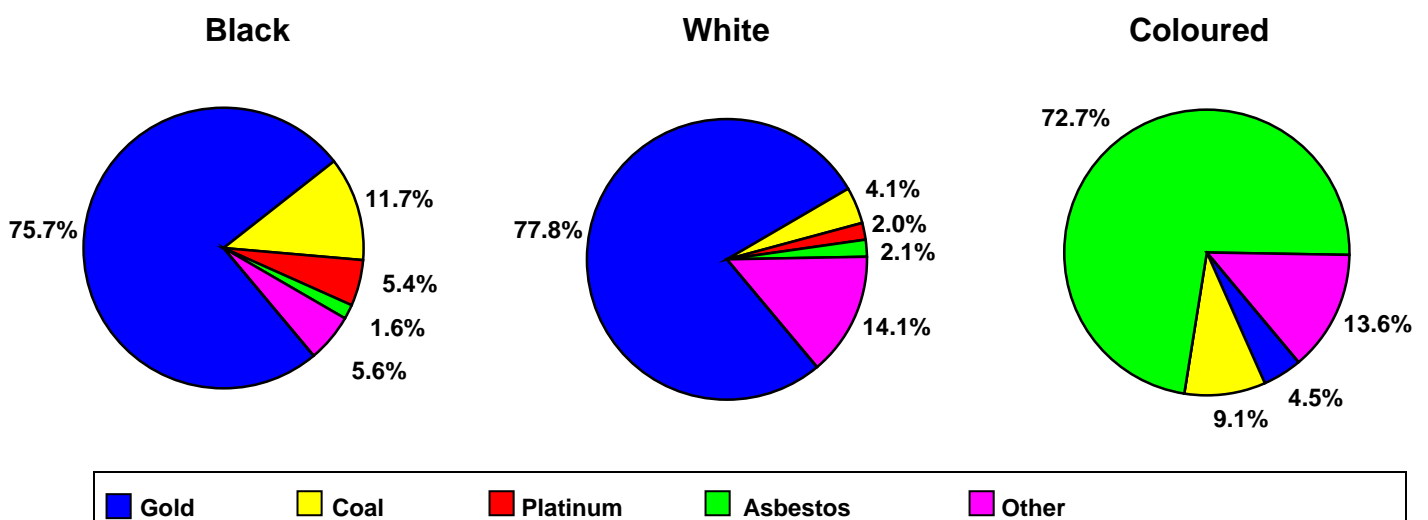
Cases were placed in categories according to the commodity in which they had worked for the longest duration (most exposure). Many men worked in a number of different mining commodities during their lifetimes and had "mixed" exposures. This was not taken into account in the analysis of exposure type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

Table 2-4 and Figure 2-2 show the distribution of autopsies by commodity and population group for 1982.

**TABLE 2-4 NUMBER AND PROPORTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (1982)**

NOTE: This table shows only those commodities where a total of 10 or more cases were received

Commodity	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
Gold	1750	75.7	1 013	77.8	2	4.5	0	-	2 765	75.6
Platinum	126	5.4	26	2.0	0	-	0	-	152	4.2
Coal	270	11.7	53	4.1	4	9.1	0	-	327	8.9
Asbestos	37	1.6	27	2.1	32	72.7	0	-	96	2.6
Iscor	16	0.7	76	5.8	1	2.3	0	-	93	2.5
Diamond	8	0.3	11	0.8	1	2.3	0	-	20	0.5
Copper	14	0.6	30	2.3	0	-	0	-	44	1.2
Other	12	0.5	2	0.2	0	-	0	-	14	0.4
Unknown	79	3.4	64	4.9	4	9.1	1	100.0	148	4.0
<b>Total</b>	<b>2 312</b>		<b>1 302</b>		<b>44</b>		<b>1</b>		<b>3 659</b>	

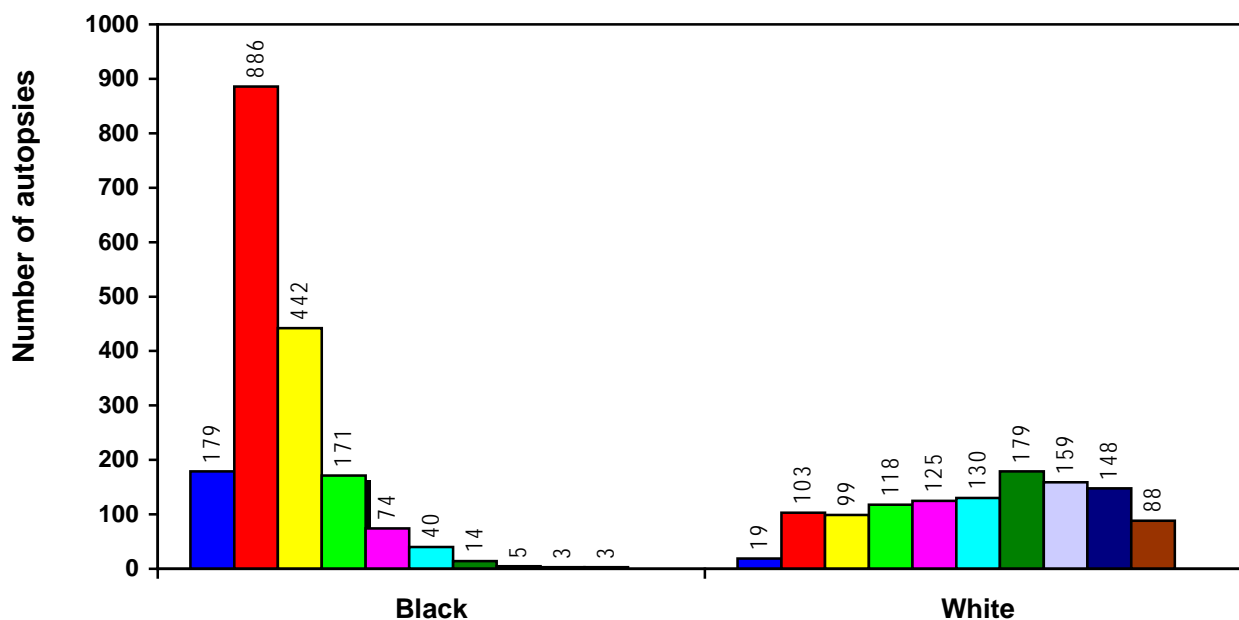


**FIG 2-2 DISTRIBUTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (1982)**

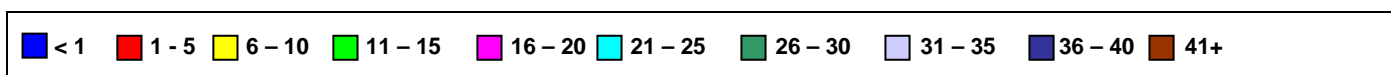
Detailed information about the years in mining service by population group is presented in Table 2-5 and Figure 2-3.

**TABLE 2-5 NUMBER AND PROPORTION OF AUTOPSIES BY YEARS OF SERVICE AND POPULATION GROUP (1982)**

Years of service	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
<1	179	7.7	19	1.5	0	-	0	-	198	5.4
1-5	886	38.3	103	7.9	6	13.6	0	-	995	27.2
6-10	442	19.1	99	7.6	5	11.4	0	-	546	14.9
11-15	171	7.4	118	9.1	8	18.2	0	-	297	8.1
16-20	74	3.2	125	9.6	7	15.9	0	-	206	5.6
21-25	40	1.7	130	10.0	1	2.3	0	-	171	4.7
26-30	14	0.6	179	13.7	5	11.4	0	-	198	5.4
31-35	5	0.2	159	12.2	4	9.1	0	-	168	4.6
36-40	3	0.1	148	11.4	2	4.5	0	-	153	4.2
41+	3	0.1	88	6.8	1	2.3	0	-	92	2.5
Unknown	495	21.4	134	10.3	5	11.4	1	100.0	635	17.4
<b>Total</b>	<b>2 312</b>		<b>1 302</b>		<b>44</b>		<b>1</b>		<b>3 659</b>	



Years of service:



**FIG 2-3 DISTRIBUTION OF AUTOPSIES BY YEARS OF SERVICE AND POPULATION GROUP (1982)**

The mean age and duration of service by commodity type 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 (1982)**

Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
Gold	1 669	35.1	11.0	1 010	59.8	15.1
Platinum	126	34.5	11.7	26	49.2	14.1
Coal	267	38.9	13.2	53	57.3	15.3
Asbestos	35	41	13.4	26	57.0	11.3
Iscor	15	46.2	14.1	76	54.4	15.1
Diamond	7	40.9	12.0	11	53.8	14.0
Copper	13	45.8	14.0	30	59.0	12.5
Other	12	41.6	13.1	2	43.5	21.9
Unknown	71	40.8	13.6	59	56.9	16.9
Total	2 215	40.5	12.9	1 293	54.5	15.1

\* Standard deviation

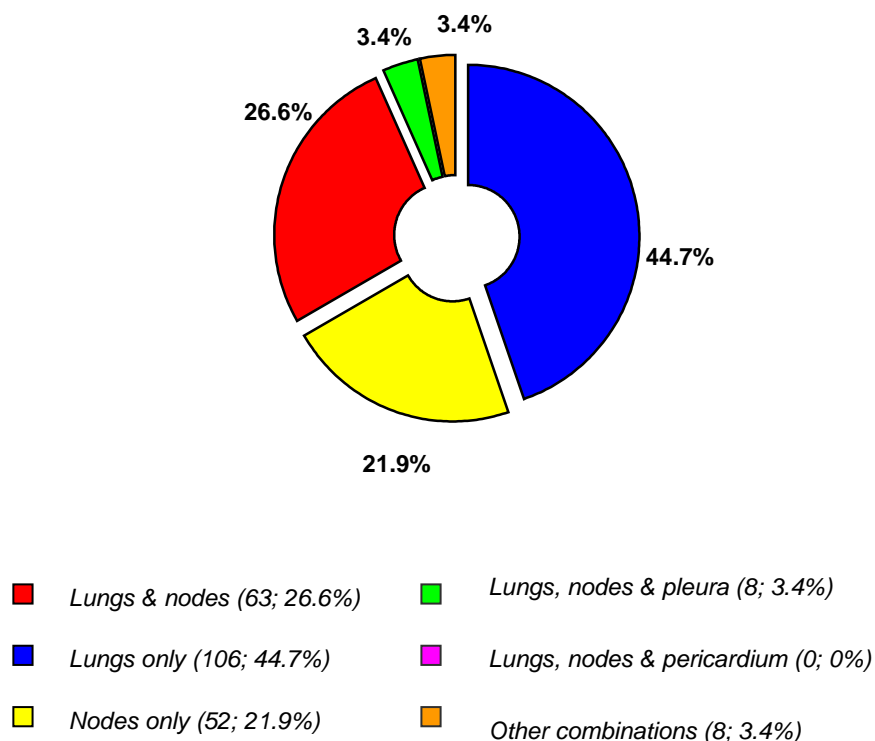
**TABLE 2-7 MEAN DURATION OF SERVICE BY COMMODITY AND POPULATION GROUP (1982)**

Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
Gold	1 435	6.4	5.7	954	25.3	12.4
Platinum	109	4.3	3.1	24	11.6	6.9
Coal	189	7.9	8.1	50	22.7	11.9
Asbestos	23	5.3	6.0	26	12.3	7.3
Iscor	11	8.9	5.7	51	17.4	11.4
Diamond	3	18.3	13.6	11	18.2	11.4
Copper	5	9.9	6.9	28	19.9	9.6
Other	12	9.1	10.6	2	4.5	2.1
Unknown	30	7.9	6.4	22	16.9	9.8
Total	1 817	8.7	7.3	1 168	16.5	9.2

\* Standard deviation

### SECTION 3 – ACTIVE TUBERCULOSIS

The distribution of active tuberculosis (TB) by anatomical site is presented in Figure 3-1 (n=237). Active pulmonary TB (PTB) was diagnosed in 4.9% (181) of all cases autopsied in 1982. Most of the men with PTB were black (84.5%; 153 cases), 12.7% (23 cases) were white, 2.2% (4 cases) were coloured and in 0.6% (1 case) the population group was unknown.



**FIG 3-1 DISTRIBUTION OF ACTIVE TB BY SITE (1982)**

The distribution of active PTB cases by commodity is shown in Table 3-1. The rates in this and subsequent tables and figures are expressed per 1000. The majority of active PTB cases (74.6%) came from the gold mining industry (75.6% of all autopsy cases came from that commodity).

**TABLE 3-1 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY COMMODITY AND POPULATION GROUP (1982)**

Commodity	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Gold	117	67	18	18	0	-	0	-	135	49
Platinum	2	16	0	-	0	-	0	-	2	13
Coal	17	63	1	19	0	-	0	-	18	55
Asbestos	5	135	1	37	4	125	0	-	10	104
Iscor	1	63	0	-	0	-	0	-	1	11
Other	3	250	0	-	0	-	0	-	3	214
Unknown	8	101	3	47	0	-	1	1 000	12	81
<b>Total</b>	<b>153</b>	<b>66</b>	<b>23</b>	<b>18</b>	<b>4</b>	<b>91</b>	<b>1</b>	<b>1 000</b>	<b>181</b>	<b>49</b>

The age distribution of cases with active PTB is shown in Table 3-2. Most of the cases were between 20-69 years (163 cases=90.1%)

**TABLE 3-2 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY AGE AND POPULATION GROUP (1982)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
<20	1	22	0	-	0	-	0	-	1	20
20-29	20	26	1	13	0	-	0	-	21	25
30-39	32	51	1	13	0	-	0	-	33	47
40-49	43	103	1	7	0	-	0	-	44	77
50-59	27	106	6	23	2	133	0	-	35	66
60-69	21	194	9	23	0	-	0	-	30	58
70-79	1	200	2	8	2	250	0	-	5	18
80+	0	-	2	32	0	-	0	-	2	32
Unknown	8	82	1	111	0	-	1	1 000	10	93
<b>Total</b>	<b>153</b>	<b>66</b>	<b>23</b>	<b>18</b>	<b>4</b>	<b>91</b>	<b>1</b>	<b>1 000</b>	<b>181</b>	<b>49</b>

## SECTION 4 – SILICOSIS

*Silicotic nodules were found in the lungs of 471 cases (12.9% of all autopsies), 91.5% of which came from the gold mining industry. Of all cases of silicosis, occasional silicotic nodules were found in 45.6% of cases, a few in 32.3%, a moderate number in 18.5% and a large number in 3.6%.*

*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 (1982)**

Commodity	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Gold	144	82	287	283	0	-	0	-	431	156
Platinum	2	16	1	38	0	-	0	-	3	20
Coal	7	26	6	113	0	-	0	-	13	40
Asbestos	0	0	3	111	4	125	0	-	7	73
Diamond	1	125	1	91	0	-	0	-	2	100
Copper	1	71	4	133	0	-	0	-	5	114
Isacor	1	63	0	-	0	-	0	-	1	11
Unknown	4	51	4	63	0	-	1	1 000	9	61
<b>Total</b>	<b>160</b>	<b>69</b>	<b>306</b>	<b>235</b>	<b>4</b>	<b>91</b>	<b>1</b>	<b>1 000</b>	<b>471</b>	<b>129</b>

*Although the silicosis rates increased with increasing age in both black and white men, the age distribution of cases with silicosis differed between the two population groups (Table 4-2).*

**TABLE 4-2 NUMBER OF CASES AND PREVALENCE OF SILICOSIS IN THE GOLD MINING INDUSTRY, BY AGE AND POPULATION GROUP (1982)**

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	4	7	1	17	0	-	5	8
30-39	35	71	0	-	0	-	35	64
40-49	63	206	14	123	0	-	77	183
50-59	30	188	45	239	0	-	75	216
60-69	8	114	112	350	0	-	120	308
70-79	0	-	89	401	0	-	89	399
80+	0	-	26	473	0	-	26	473
Unknown	4	129	0	-	0	-	4	118
<b>Total</b>	<b>144</b>	<b>82</b>	<b>287</b>	<b>283</b>	<b>0</b>		<b>431</b>	<b>156</b>

Silicosis was diagnosed in men who were young (<40 years) and in men who were exposed to silica for a few years (< 10 years) (Table 4-3).

**TABLE 4-3 NUMBER OF CASES AND PREVALENCE OF SILICOSIS IN THE GOLD MINING INDUSTRY, BY YEARS OF SERVICE AND POPULATION GROUP (1982)**

Years of service	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
<1	4	28	1	91	0	-	5	33
1-5	24	35	2	24	0	-	26	34
6-10	43	117	3	48	0	-	46	107
11-15	24	175	19	224	0	-	43	194
16-20	13	236	26	310	0	-	39	279
21-25	6	200	22	210	0	-	28	207
26-30	3	429	63	394	0	-	66	395
31-35	1	250	57	393	0	-	58	389
36-40	0	-	56	412	0	-	56	406
41+	0	-	33	393	0	-	33	388
Unknown	26	83	5	85	0	-	31	83
<i>Total</i>	144	82	287	283	0		431	156



## SECTION 5 – OTHER PNEUMOCONIOSES

### MASSIVE FIBROSIS

There were 14 (0.4%) cases of massive fibrosis (2 black, 12 white). Ten (10) were from the gold mining industry, 1 from the coal mining industry and in 3 cases the industry was not known.

### COAL WORKERS' PNEUMOCONIOSIS

There were 24 (0.7%) cases of coal workers' pneumoconiosis of which all cases were from the coal mining industry.

### MIXED DUST PNEUMOCONIOSIS

There were 42 (1.1%) cases of mixed dust pneumoconiosis. These cases came from the gold (n=37) and coal (n=2) mining industries, as well as from Iscor (n=1). In two cases the industry was not stated.

### ASBESTOSIS AND PLEURAL PLAQUES

There were 86 cases of asbestosis of which 66.3% (n=57) had slight, 31.4% (n=27) moderate and 2.3% (n=2) marked fibrosis. Of these, 61 (70.9%) had worked in the asbestos mining industry at some time in their lives. There were 30 cases that had asbestos plaques and 24 (80.0%) of these had asbestosis. Note that 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 (1982)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
20-29	2	3	0	-	0	-	0	-	2	2
30-39	6	10	1	13	0	-	0	-	7	10
40-49	12	29	1	7	1	200	0	-	14	24
50-59	10	39	10	39	12	800	0	-	32	61
60-69	3	28	7	18	7	636	0	-	17	33
70-79	0	-	4	15	6	750	0	-	10	36
80+	0	-	2	32	0	-	0	-	2	32
Unknown	1	10	0	-	0	-	1	1 000	2	19
<b>Total</b>	<b>34</b>	<b>15</b>	<b>25</b>	<b>19</b>	<b>26</b>	<b>591</b>	<b>1</b>	<b>1 000</b>	<b>86</b>	<b>24</b>

## SECTION 6 – EMPHYSEMA

There were 1 086 cases of emphysema, the extent of which was mild in 77.1% (n=837), moderate in 22.5% (n=244) and marked in 0.5% (n=5). 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 (1982)**

Age group (years)	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
20-29	13	17	0	-	0	-	0	-	13	16
30-39	61	97	11	141	0	-	0	-	72	102
40-49	84	201	63	414	0	-	0	-	147	256
50-59	77	303	163	629	6	400	0	-	246	466
60-69	34	315	295	743	6	545	0	-	335	649
70-79	3	600	207	784	2	250	0	-	212	765
80+	0	-	44	698	0	-	0	-	44	698
Unknown	13	134	3	333	0	-	1	1 000	17	159
<b>Total</b>	<b>285</b>	<b>123</b>	<b>786</b>	<b>604</b>	<b>14</b>	<b>318</b>	<b>1</b>	<b>1 000</b>	<b>1 086</b>	<b>297</b>

The majority of black and white men with emphysema were from the gold mining industry (73.4%, n=797) (Table 6-2).

**TABLE 6-2 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY COMMODITY AND POPULATION GROUP (1982)**

Commodity	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Gold	174	99	623	615	0	-	0	-	797	288
Platinum	14	111	9	346	0	-	0	-	23	151
Coal	61	226	34	642	1	250	0	-	96	294
Asbestos	10	270	13	481	10	313	0	-	33	344
Diamond	2	250	5	455	1	1 000	0	-	8	400
Copper	2	143	19	633	0	-	0	-	21	477
Iscor	1	63	50	658	0	-	0	-	51	548
Other	3	250	1	500	0	-	0	-	4	286
Unknown	18	228	32	500	2	500	1	1 000	53	358
<b>Total</b>	<b>285</b>	<b>123</b>	<b>786</b>	<b>604</b>	<b>14</b>	<b>318</b>	<b>1</b>	<b>1 000</b>	<b>1 086</b>	<b>297</b>

**TABLE 6-3 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY YEARS OF SERVICE AND POPULATION GROUP (1982)**

Years of service	Black		White		Coloured		Unknown		Total	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
<1	13	73	5	263	0	-	0	-	18	91
1 – 5	66	74	25	243	1	167	0	-	92	92
6-10	50	113	41	414	0	-	0	-	91	167
11-15	29	170	73	619	3	375	0	-	105	354
16-20	19	257	78	624	2	286	0	-	99	481
21-25	9	225	86	662	0	-	0	-	95	556
26-30	4	286	120	670	1	200	0	-	125	631
31-35	1	200	122	767	2	500	0	-	125	744
36-40	1	333	103	696	2	1 000	0	-	106	693
41+	3	1 000	66	750	1	1 000	0	-	70	761
Unknown	90	182	67	500	2	400	1	1 000	160	252
<i>Total</i>	285	123	786	604	14	318	1	1 000	1 086	297

## SECTION 7 – MESOTHELIOMA

*There were 20 cases of mesothelioma in 1982*

**TABLE 7-1 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY AGE AND POPULATION GROUP (1982)**

Age group (years)	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
20-29	0	-	1	7.7	0	-	1	5.0
30-39	0	-	0	-	0	-	0	-
40-49	1	50.0	1	7.7	2	40.0	4	20.0
50-59	1	50.0	3	23.1	2	40.0	6	30.0
60-69	0	-	4	30.8	0	-	4	20.0
70-79	0	-	3	23.1	1	20.0	4	20.0
80+	0	-	0	-	0	-	0	-
Unknown	0	-	1	7.7	0	-	1	5.0
<b>Total</b>	<b>2</b>		<b>13</b>		<b>5</b>		<b>20</b>	

*The distribution of mesothelioma by commodity and population group is presented in Table 7.2. Nine (45.0%) had worked in the asbestos mining industry.*

**TABLE 7-2 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY COMMODITY AND POPULATION GROUP (1982)**

Commodity	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Gold	0	-	5	38.5	0	-	5	25.0
Asbestos	0	-	1	7.7	4	80.0	5	25.0
Diamond	0	-	1	7.7	0	-	1	5.0
Copper	2	100.0	0	-	0	-	2	10.0
Unknown	0	-	6	46.2	1	20.0	7	35.0
<b>Total</b>	<b>2</b>		<b>13</b>		<b>5</b>		<b>20</b>	

## SECTION 8 – PRIMARY LUNG CANCER

One hundred and nine cases of primary lung cancer were found at autopsy, 13.8% of which were in black, 80.7% in white and 5.5% in coloured men. Most of the cases were small cell lung carcinoma (34.9%; n=38), followed by squamous lung carcinomas (33.9%; n=37), adeno carcinoma (16.5%; n=18), large cell lung carcinoma (11.9%; n=13) and broncho-alveolar carcinoma (2.8%; n=3)

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

**TABLE 8-1 NUMBERS OF CASES AND PREVALENCE OF PRIMARY LUNG CANCER BY AGE AND POPULATION GROUP (1982)**

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	2	3	0	-	0	-	2	2
30-39	1	2	0	-	0	-	1	1
40-49	3	7	2	13	0	-	5	9
50-59	8	31	18	69	2	133	28	53
60-69	0	-	42	106	4	364	46	89
70-79	0	-	24	91	0	-	24	87
80+	0	-	2	32	0	-	2	32
Unknown	1	10	0	-	0	-	1	9
<b>Total</b>	<b>15</b>	<b>6</b>	<b>88</b>	<b>68</b>	<b>6</b>	<b>136</b>	<b>109</b>	<b>30</b>

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 (1982)**

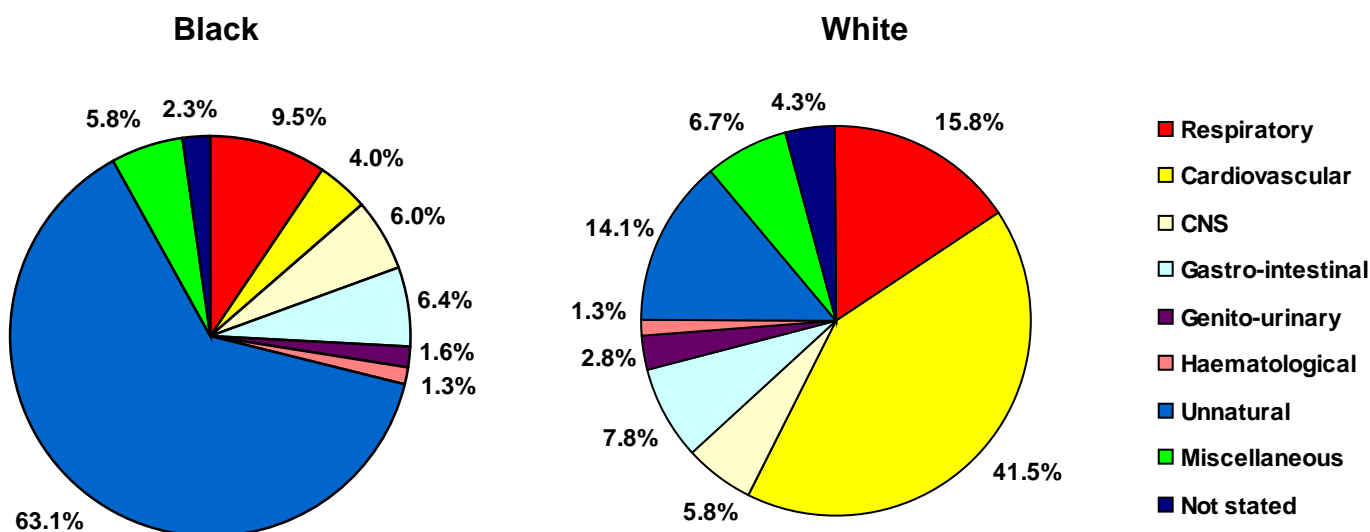
Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	7	4	69	68	0	-	76	27
Platinum	1	8	0	-	0	-	1	7
Coal	1	4	4	75	1	250	6	18
Asbestos	3	81	1	37	4	125	8	83
Diamond	0	-	0	-	1	1 000	1	50
Copper	1	71	5	167	0	-	6	136
Iscor	0	-	6	79	0	-	6	65
Other	1	83	0	-	0	-	1	71
Unknown	1	13	3	47	0	-	4	27
<b>Total</b>	<b>15</b>	<b>6</b>	<b>88</b>	<b>68</b>	<b>6</b>	<b>136</b>	<b>109</b>	<b>30</b>

## SECTION 9 – CLINICAL CAUSES OF DEATH

Table 9-1 and Figure 9-1 show the clinical causes of death as stated in the accompanying documents submitted with the cardio-respiratory organs, by population group. Diseases of the cardio-vascular system were the most frequent (17.5%) overall. Black men had the highest proportion of unnatural causes of death (63.1%). In 3.3% of all cases, the cause of death was not stated.

**TABLE 9-1 CLINICAL CAUSES OF DEATH BY POPULATION GROUP (1982)**

System	Black		White		Coloured		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%
Respiratory	219	9.5	206	15.8	13	29.5	0	-	438	12.0
Cardio-vascular	93	4.0	540	41.5	8	18.2	0	-	641	17.5
Central Nervous System	138	6.0	75	5.8	2	4.5	0	-	215	5.9
Gastro-intestinal	148	6.4	102	7.8	3	6.8	0	-	253	6.9
Genito-urinary	37	1.6	36	2.8	0	-	0	-	73	2.0
Haematological	30	1.3	17	1.3	0	-	0	-	47	1.3
Unnatural	1 458	63.1	183	14.1	4	9.1	0	-	1 645	45.0
Miscellaneous	135	5.8	87	6.7	6	13.6	0	0	228	6.2
Not stated	54	2.3	56	4.3	8	18.2	1	100.0	119	3.3
<b>Total</b>	<b>2 312</b>		<b>1 302</b>		<b>44</b>		<b>1</b>		<b>3 659</b>	



**FIGURE 9-1 CLINICAL CAUSE OF DEATH AS STATED BY THE CLINICIANS WHO SUBMIT THE ORGANS OF THE DECEASED TO THE NIOH (1982)**