



**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 1981**

**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 14/2011**

[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.*

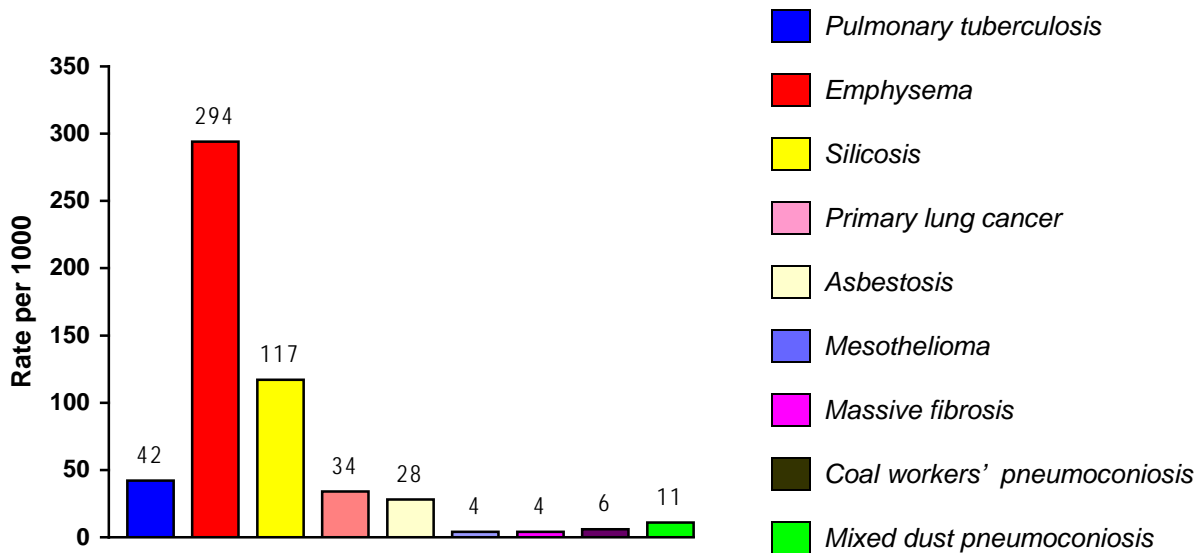
*We also thank Lizet Vermaak for collating and Prof Tony Davies for editing the manuscript.*

## EXECUTIVE SUMMARY

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During 1981, 3 359 cases came to autopsy at the NIOH. Of these, 65.8% were black men, 33.3% were white and 1.0% were coloured.

Overall disease rates (per 1 000 autopsies) for 1981 are shown in Figure 1.



**FIG 1 OVERALL DISEASE RATES FOR 1981**

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## **GLOSSARY**

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<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

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*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 1981. 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 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 number of autopsies performed since 1981 is presented in Table 2-1.

**TABLE 2-1 DISTRIBUTION OF AUTOPSIES BY YEAR AND POPULATION GROUP (1975 - 1981)**

Year of autopsy	Black		White		Coloured		Total 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
<b>Total</b>	15 786	67	7 472	32	248	1	23 506

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 1981. Autopsies of only the cardio-respiratory organs comprised 82.4% of all examinations.

**TABLE 2-2 NUMBER AND PROPORTION OF AUTOPSIES BY TYPE AND POPULATION GROUP (1981)**

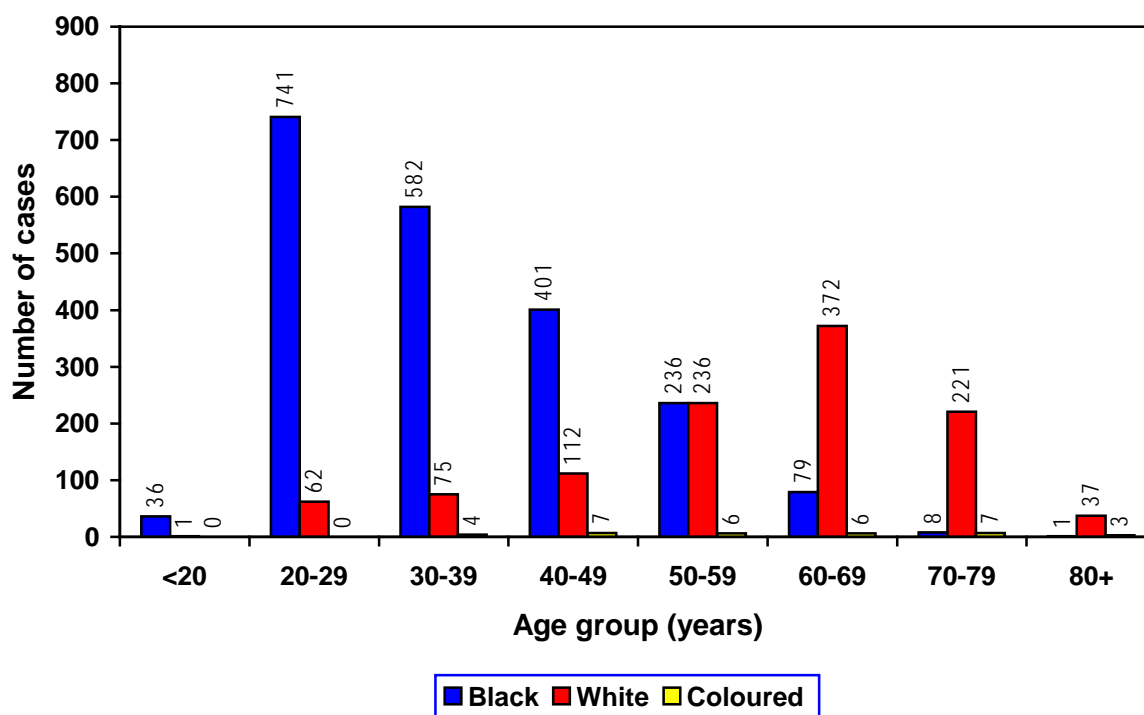
Autopsy type	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Cardio-respiratory organs only	2 113	95.7	623	55.8	31	93.9	2 767	82.4
Full autopsy	96	4.3	494	44.2	2	6.1	592	17.6
<b>Total</b>	2 209		1 117		33		3 359	



The age distribution of autopsies for 1981 is shown in Table 2-3 and Figure 2-1. The mean age at autopsy of black men was 33.8 years. The mean age of white men at autopsy was 58.8 years and for coloured men 59.4 years

**TABLE 2-3 NUMBER AND PROPORTION OF AUTOPSIES BY AGE AND POPULATION GROUP (1981)**

Age group (years)	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
<20	36	1.6	1	0.1	0	-	37	1.1
20-29	741	33.5	62	5.6	0	-	803	23.9
30-39	582	26.3	75	6.7	4	12.1	661	19.7
40-49	401	18.2	112	10.0	7	21.2	520	15.5
50-59	236	10.7	236	21.1	6	18.2	478	14.2
60-69	79	3.6	372	33.3	6	18.2	457	13.6
70-79	8	0.4	221	19.8	7	21.2	236	7.0
80+	1	-	37	3.3	3	9.1	41	1.2
Unknown	125	5.7	1	0.1	0	-	126	3.8
<b>Total</b>	<b>2 209</b>		<b>1 117</b>		<b>33</b>		<b>3 359</b>	



**FIG 2-1 DISTRIBUTION OF AUTOPSIES BY AGE AND POPULATION GROUP (1981)**

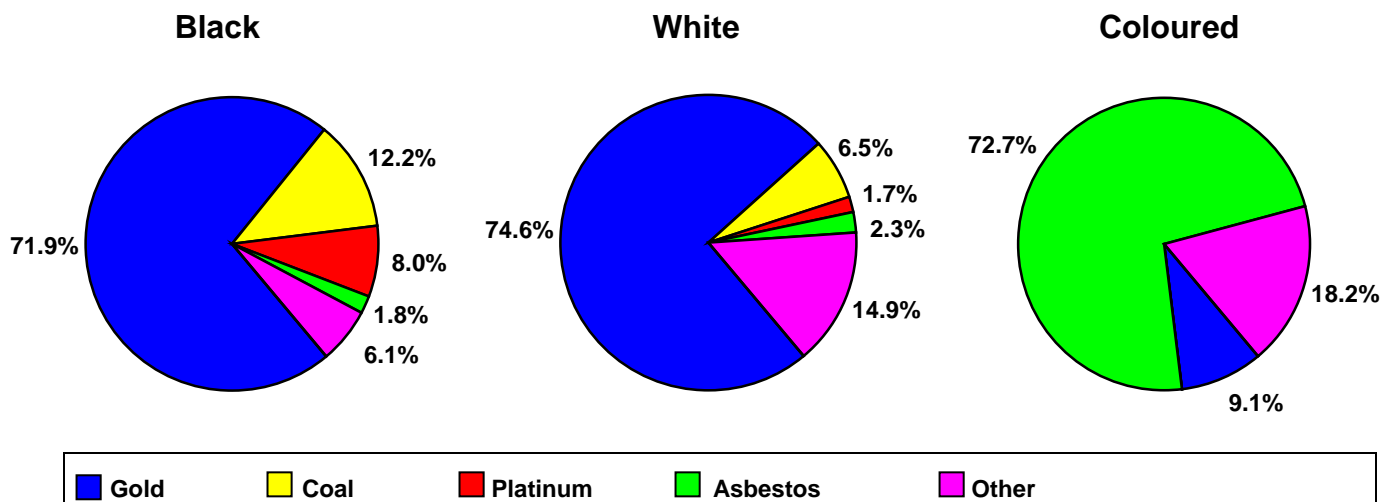
Cases were placed in categories according to the commodity in which they had worked for the longest duration (most exposure). Many men worked in a number of different mining commodities during their lifetimes and had “mixed” exposures. This was not taken into account in the analysis of exposure type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

Table 2-4 and Figure 2-2 show the distribution of autopsies by commodity and population group for 1981.

**TABLE 2-4 NUMBER AND PROPORTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (1981)**

Commodity	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Gold	1 589	71.9	833	74.6	3	9.1	2 425	72.2
Platinum	176	8.0	19	1.7	0	-	195	5.8
Coal	269	12.2	73	6.5	0	-	342	10.2
Asbestos	40	1.8	26	2.3	24	72.7	90	2.7
Iscor	4	0.2	88	7.9	1	3.0	93	2.8
Diamond	20	0.9	7	0.6	0	-	27	0.8
Copper	27	1.2	29	2.6	3	9.1	59	1.8
Other	20	0.9	8	0.7	1	3.0	29	0.9
Unknown	64	2.9	34	3.0	1	3.0	99	2.9
<b>Total</b>	<b>2 209</b>		<b>1 117</b>		<b>33</b>		<b>3 359</b>	

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

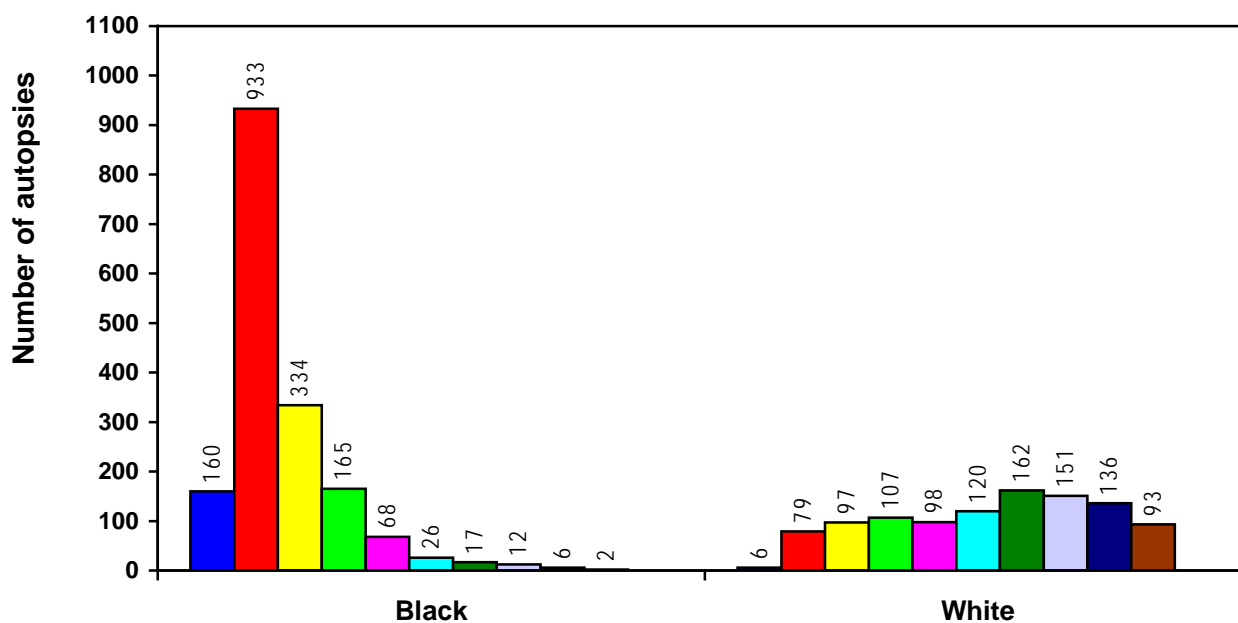


**FIG 2-2 DISTRIBUTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (1981)**

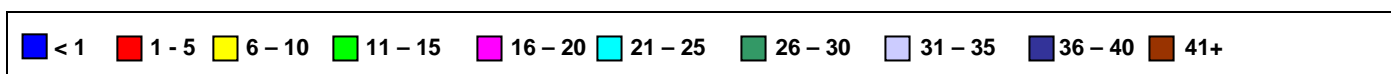
Detailed information about the years in mining service by population group is presented in Table 2-5 and Figure 2-3.

**TABLE 2-5 NUMBER AND PROPORTION OF AUTOPSIES BY YEARS OF SERVICE AND POPULATION GROUP (1981)**

Years of service	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
<1	160	7.2	6	0.5	0	-	166	4.9
1-5	933	42.2	79	7.1	5	15.2	1 017	30.3
6-10	334	15.1	97	8.7	5	15.2	436	13.0
11-15	165	7.5	107	9.6	8	24.2	280	8.3
16-20	68	3.1	98	8.8	6	18.2	172	5.1
21-25	26	1.2	120	10.7	2	6.1	148	4.4
26-30	17	0.8	162	14.5	4	12.1	183	5.4
31-35	12	0.5	151	13.5	0	-	163	4.9
36-40	6	0.3	136	12.2	0	-	142	4.2
41+	2	0.1	93	8.3	1	3.0	96	2.9
Unknown	486	22.0	68	6.1	2	6.1	556	16.6
<b>Total</b>	<b>2 209</b>		<b>1 117</b>		<b>33</b>		<b>3 359</b>	



Years of service:



**FIG 2-3 DISTRIBUTION OF AUTOPSIES BY YEARS OF SERVICE AND POPULATION GROUP (1981)**

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 (1981)**

Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
Gold	1 488	35.1	11.2	832	60.1	14.2
Platinum	174	33.2	11.6	19	49.3	16.6
Coal	262	38.7	12.7	73	54.2	14.9
Asbestos	38	40.3	13.3	26	57.3	9.1
Iscor	4	51.8	15.9	88	54.0	14.3
Diamond	18	39.6	10.8	7	64.7	18.2
Copper	23	42.0	14.1	29	58.2	13.3
Other	20	42.8	11.9	8	52.1	10.9
Unknown	57	51.8	15.9	34	58.1	13.4
Total	2 084	41.7	13.0	1 116	56.4	13.9

\* Standard deviation

**TABLE 2-7 MEAN DURATION OF SERVICE BY COMMODITY AND POPULATION GROUP (1981)**

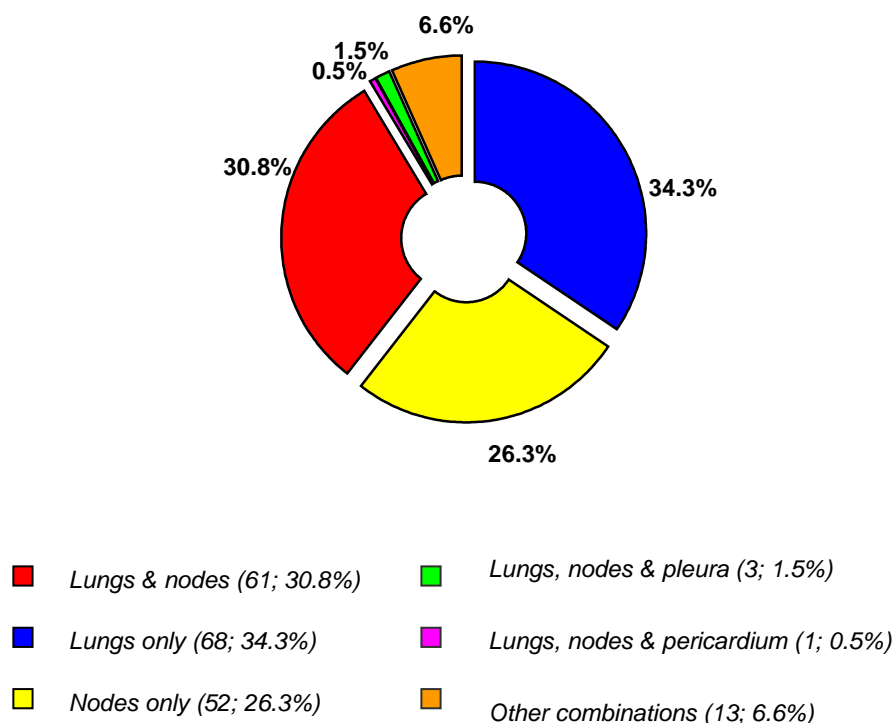
Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
Gold	1 294	6.3	6.0	818	26.5	12.0
Platinum	152	4.3	4.3	17	12.5	9.4
Coal	178	8.0	8.3	70	20.9	13.6
Asbestos	30	7.4	8.2	25	15.8	8.6
Iscor	1	-	-	58	18.6	12.5
Diamond	16	6.7	6.2	7	15.6	13.7
Copper	11	4.2	5.9	29	21.5	10.0
Other	1	-	-	8	19.6	7.1
Unknown	21	7.4	6.1	17	17.2	9.9
Total	1 704	6.3	6.4	1 049	18.7	10.8

\* Standard deviation

### SECTION 3 – ACTIVE TUBERCULOSIS

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The distribution of active tuberculosis (TB) by anatomical site is presented in Figure 3-1 (n=198). Active pulmonary TB (PTB) was diagnosed in 4.2% (141) of all cases autopsied in 1981. Most of the men with PTB were black (90.8%; 128 cases), 7.8% (11 cases) were white and in 1.4% (2 cases) the population group was unknown.



**FIG 3-1 DISTRIBUTION OF ACTIVE TB BY SITE (1981)**

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 1 000. The majority of active PTB cases (73.8%) came from the gold mining industry (72.2% of all autopsy cases came from that commodity).

**TABLE 3-1 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY COMMODITY AND POPULATION GROUP (1981)**

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	95	60	9	11	0	-	104	43
Platinum	4	23	0	-	0	-	4	21
Coal	19	71	0	-	0	-	19	56
Asbestos	2	50	1	38	2	83	5	56
Diamond	2	100	0	-	0	-	2	74
Copper	0	-	1	34	0	-	1	17
Unknown	6	94	0	-	0	-	6	61
<b>Total</b>	<b>128</b>	<b>58</b>	<b>11</b>	<b>10</b>	<b>2</b>	<b>61</b>	<b>141</b>	<b>42</b>

The age distribution of cases with active PTB is shown in Table 3-2. Most of the cases were aged between 20 and 59 years (n=118; 83.7%)

**TABLE 3-2 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY AGE AND POPULATION GROUP (1981)**

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	25	34	0	-	0	-	25	31
30-39	33	57	0	-	1	250	34	51
40-49	29	72	0	-	0	-	29	56
50-59	26	110	4	17	0	-	30	63
60-69	2	25	4	11	1	167	7	15
70-79	2	250	3	14	0	-	5	21
80+	0	-	0	-	0	-	0	-
Unknown	11	88	0	-	0	-	11	87
<b>Total</b>	<b>128</b>	<b>58</b>	<b>11</b>	<b>10</b>	<b>2</b>	<b>61</b>	<b>141</b>	<b>42</b>

## SECTION 4 – SILICOSIS

*Silicotic nodules were found in the lungs of 393 cases (11.7% of all autopsies), 90.3% of which came from the gold mining industry. Of all cases of silicosis, occasional silicotic nodules were found in 44.5% of cases, a few in 28.2%, a moderate number in 20.9% and a large number in 6.4%.*

*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 (1981)**

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	103	65	252	303	0	-	355	146
Platinum	2	11	2	105	0	-	4	21
Coal	9	33	4	55	0	-	13	38
Asbestos	0	-	3	115	3	125	6	67
Diamond	1	50	0	-	0	-	1	37
Copper	0	-	2	69	0	-	2	34
Iscor	0	-	2	23	0	-	2	22
Other	1	50	0	-	0	-	1	34
Unknown	2	31	7	206	0	-	9	91
<b>Total</b>	<b>118</b>	<b>53</b>	<b>272</b>	<b>244</b>	<b>3</b>	<b>91</b>	<b>393</b>	<b>117</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 (1981)**

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	4	7	0	-	0	-	4	7
30-39	31	72	1	20	0	-	32	67
40-49	35	119	10	137	0	-	45	123
50-59	21	151	32	203	0	-	53	178
60-69	5	119	107	373	0	-	112	340
70-79	2	667	84	444	0	-	86	448
80+	0	-	18	563	0	-	18	545
Unknown	5	50	0	-	0	-	5	200
<b>Total</b>	<b>103</b>	<b>65</b>	<b>252</b>	<b>303</b>	<b>0</b>	<b>-</b>	<b>355</b>	<b>146</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 (1981)**

Years of service	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
<1	1	9	0	-	0	-	1	8
1-5	17	25	1	23	0	-	18	24
6-10	32	115	6	92	0	-	38	111
11-15	24	189	9	134	0	-	33	169
16-20	11	250	16	219	0	-	27	231
21-25	2	133	27	303	0	-	29	276
26-30	1	91	45	344	0	-	46	322
31-35	1	143	61	445	0	-	62	431
36-40	0	-	62	500	0	-	62	481
41+	0	-	25	305	0	-	25	301
Unknown	14	47	0	-	0	-	14	45
<i>Total</i>	103	65	252	303	0		355	146



## SECTION 5 – OTHER PNEUMOCONIOSES

### MASSIVE FIBROSIS

There were 14 (0.4%) cases of massive fibrosis (1 black, 13 white). Ten cases of massive fibrosis were from the gold mining industry, 2 from the coal mining industry, 1 from the asbestos mining industry and in 1 case the industry type was not stated.

### COAL WORKERS' PNEUMOCONIOSIS

There were 21 (0.6%) cases of coal workers' pneumoconiosis of which 20 cases were from the coal mining industry. The other case was from the gold mining industry.

### MIXED DUST PNEUMOCONIOSIS

There were 36 (1.1%) cases of mixed dust pneumoconiosis. These cases came from the gold (n=27), coal (n=4), asbestos (n=2) and copper (n=2) mining industries. In one case the industry was not stated.

### ASBESTOSIS AND PLEURAL PLAQUES

There were 95 cases of asbestosis of which 69.5% (n=66) had slight, 27.4% (n=26) moderate and 3.2% (n=3) marked fibrosis. Of these, 72 (75.8%) had worked in the asbestos mining industry at some time in their lives. There were 21 cases that had asbestos plaques and 17 (81.0%) 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 (1981)**

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	1	1	0	-	0	-	1	1
30-39	4	7	0	-	1	250	5	8
40-49	12	30	2	18	4	571	18	35
50-59	14	59	15	64	4	667	33	69
60-69	5	63	13	35	5	833	23	50
70-79	0	-	4	18	5	714	9	38
80+	0	-	0	-	3	1 000	3	73
Unknown	3	24	0	-	0	-	3	24
<b>Total</b>	<b>39</b>	<b>18</b>	<b>34</b>	<b>30</b>	<b>22</b>	<b>667</b>	<b>95</b>	<b>28</b>

## SECTION 6 – EMPHYSEMA

There were 987 cases of emphysema, the extent of which was mild in 71.0% (n=700), moderate in 28.0% (n=277) and marked in 1.0% (n=1.0). 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 (1981)**

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	20	27	1	16	0	-	21	26
30-39	36	62	8	107	0	-	44	67
40-49	85	212	37	330	2	286	124	238
50-59	86	364	169	716	4	667	259	542
60-69	30	380	283	761	5	833	318	696
70-79	2	250	169	765	4	571	175	742
80+	0	-	27	730	2	667	29	707
Unknown	16	128	1	1 000	0	-	17	135
<b>Total</b>	<b>275</b>	<b>124</b>	<b>695</b>	<b>622</b>	<b>17</b>	<b>515</b>	<b>987</b>	<b>294</b>

The majority of black and white men with emphysema were from the gold mining industry (70.1%, n=690) (Table 6-2).

**TABLE 6-2 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY COMMODITY AND POPULATION GROUP (1981)**

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	150	94	539	647	1	333	690	285
Platinum	18	102	5	263	0	-	23	118
Coal	68	253	37	507	0	-	105	307
Asbestos	9	225	17	654	12	500	38	422
Diamond	2	100	5	714	0	-	7	259
Copper	4	148	17	586	0	-	23	356
Iscor	2	500	49	557	0	-	51	548
Other	5	250	1	125	1	1 000	7	241
Unknown	17	266	25	735	1	1 000	43	434
<b>Total</b>	<b>275</b>	<b>124</b>	<b>695</b>	<b>622</b>	<b>17</b>	<b>455</b>	<b>985</b>	<b>294</b>

**TABLE 6-3 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY YEARS OF SERVICE AND POPULATION GROUP (1981)**

Years of service	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
<1	12	75	1	167	0	-	13	78
1-5	59	63	26	329	1	200	86	85
6-10	43	129	42	433	5	1000	90	206
11-15	27	164	61	570	2	250	90	321
16-20	18	265	65	663	4	667	87	506
21-25	13	500	76	633	1	500	90	608
26-30	8	471	103	636	2	500	113	617
31-35	7	583	114	755	0	-	121	742
36-40	3	500	99	728	0	-	102	718
41+	1	500	68	731	1	1 000	70	729
Unknown	84	173	40	588	1	500	125	225
<i>Total</i>	275	124	695	622	17	515	987	294

## SECTION 7 – MESOTHELIOMA

*There were 15 cases of mesothelioma in 1981*

**TABLE 7-1 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY AGE AND POPULATION GROUP (1981)**

Age group (years)	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
30-39	1	14	0	-	1	50	2	13
40-49	2	29	1	17	1	50	4	27
50-59	3	43	1	17	0	-	4	27
60-69	1	14	3	50	0	-	4	27
70-79	0	-	1	17	0	-	1	7
80+	0	-	0	-	0	-	0	-
Unknown	0	-	0	-	0	-	0	-
<i>Total</i>	7		6		2		15	

*The distribution of mesothelioma by commodity and population group is presented in Table 7.2. Eight (53.3%) had worked in the asbestos mining industry.*

**TABLE 7-2 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY COMMODITY AND POPULATION GROUP (1981)**

Commodity	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Asbestos	4	57	2	33	2	100	8	53
Gold	1	14	2	33	0	-	3	20
Platinum	1	14	0	-	0	-	1	7
Copper	0	-	1	17	0	-	1	7
Unknown	1	14	1	17	0	-	2	13
<i>Total</i>	7		6		2		15	

## SECTION 8 – PRIMARY LUNG CANCER

One hundred and fourteen cases of primary lung cancer were found at autopsy, 27.2% of which were in black, 70.2% in white and 2.6% in coloured men. Most of the cases were small cell lung carcinoma (36.0%; n=41), followed by squamous lung carcinoma (32.5%; n=37), adeno carcinoma (14.9%; n=17), large cell lung carcinoma (9.6%; n=11) and broncho-alveolar carcinoma (7.0%; n=8)

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 (1981)**

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	1	1	0	-	0	-	1	1
30-39	3	5	0	-	0	-	3	5
40-49	8	20	1	9	0	-	9	17
50-59	13	55	21	89	1	167	35	73
60-69	3	38	38	102	0	-	41	90
70-79	0	-	19	86	1	143	20	85
80+	0	-	0	-	1	333	1	24
Unknown	3	24	1	1 000	0	-	4	32
<b>Total</b>	<b>31</b>	<b>14</b>	<b>80</b>	<b>72</b>	<b>3</b>	<b>91</b>	<b>114</b>	<b>34</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 (1981)**

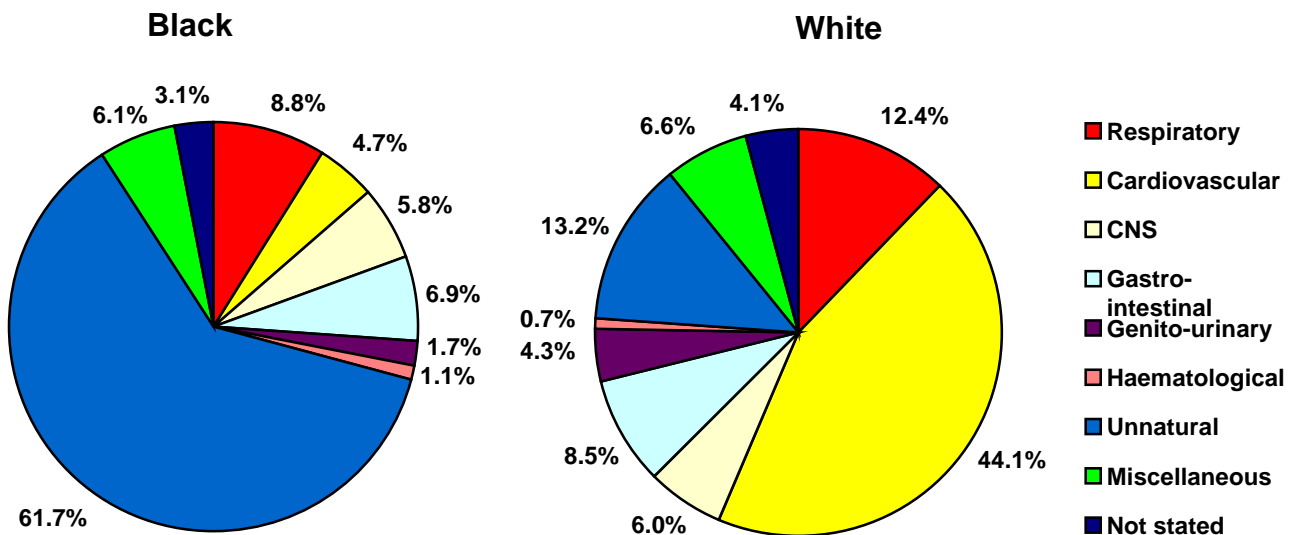
Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	20	13	61	73	0	-	81	33
Platinum	2	11	1	53	0	-	3	15
Coal	6	22	3	41	0	-	9	26
Asbestos	0	-	7	269	2	83	9	100
Diamond	0	-	0	-	0	-	0	-
Copper	1	37	1	34	1	333	3	51
Iscor	0	-	6	68	0	-	6	65
Unknown	2	31	1	29	0	-	3	30
<b>Total</b>	<b>31</b>	<b>14</b>	<b>80</b>	<b>72</b>	<b>3</b>	<b>91</b>	<b>114</b>	<b>34</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 (17.9%) overall. Black men had the highest proportion of unnatural causes of death (61.7%). In 3.5% of all cases, the cause of death was not stated.

**TABLE 9-1 CLINICAL CAUSES OF DEATH BY POPULATION GROUP (1981)**

System	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Respiratory	195	8.8	138	12.4	11	33.3	344	10.2
Cardio-vascular	104	4.7	493	44.1	4	12.1	601	17.9
Central Nervous System	128	5.8	67	6.0	0	-	195	5.8
Gastro-intestinal	152	6.9	95	8.5	2	6.1	249	7.4
Genito-urinary	38	1.7	48	4.3	0	-	86	2.6
Haematological	25	1.1	8	0.7	1	3.0	34	1.0
Unnatural	1 363	61.7	148	13.2	2	6.1	1 513	45.0
Miscellaneous	135	6.1	74	6.6	9	27.3	218	6.5
Not stated	69	3.1	46	4.1	4	12.1	119	3.5
<b>Total</b>	<b>2 209</b>		<b>1 117</b>		<b>33</b>		<b>3 359</b>	



**FIGURE 9-1 CLINICAL CAUSE OF DEATH AS STATED BY THE CLINICIANS WHO SUBMIT THE ORGANS OF THE DECEASED TO THE NIOH (1981)**