



**NATIONAL HEALTH
LABORATORY SERVICE**

NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH

Pathology Division Surveillance Report

Demographic Data and Disease Rates for January to December 1994

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EXECUTIVE SUMMARY

During 1994, 2 852 cases came to autopsy at the NIOH. Of these, 60.9% were black men, 35.8% were white and 3.3% were coloured.

Overall disease rates (per 1000 autopsies) for 1994 are shown in Figure 1.

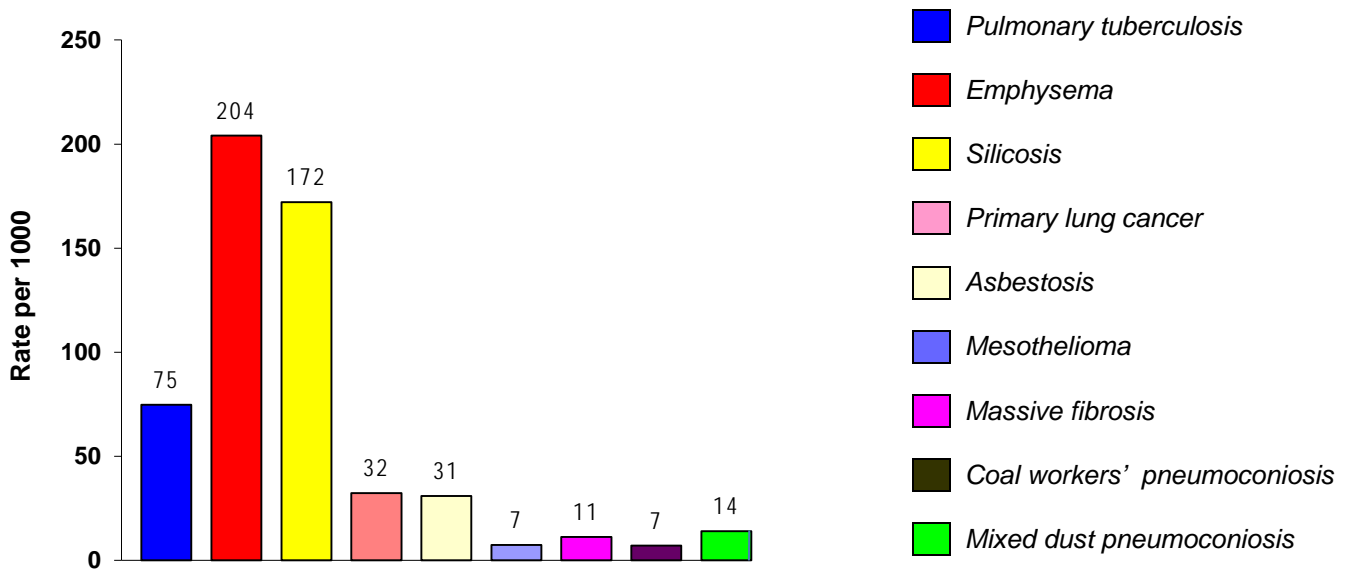


FIG 1 OVERALL DISEASE RATES FOR 1994

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GLOSSARY

Asbestosis	<i>Lung fibrosis caused by asbestos fibres</i>
Coal workers' pneumoconiosis	<i>Lung fibrosis caused by exposure to coal dust</i>
Emphysema	<i>Lung disease caused by the destruction of the alveolar walls</i>
Massive fibrosis	<i>Lung fibrosis caused by exposure to dust and measuring more than 1 cm in diameter</i>
Mesothelioma	<i>A malignant tumour of the pleural cavity of the lungs</i>
Miner	<i>A person who has worked in a controlled mine or works</i>
Mixed exposures	<i>The multiple dust types to which a miner may be exposed, having worked in several mining commodities in his lifetime</i>
Prevalence	<i>The number of cases in a defined population at a given time</i>
Silicosis	<i>Lung fibrosis caused by inhalation of silica dust; detected by the presence of silicotic nodules in the lung tissue</i>
Surveillance	<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 1994. This and other annual reports can be accessed at 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 for 1994 is presented in Table 2-1.

TABLE 2-1 DISTRIBUTION OF AUTOPSIES BY YEAR AND POPULATION GROUP (1975-1994)

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
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
Total	44 200	66	21 990	33	1 033	2	1		67 224

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 1994. Autopsies of only the cardio-respiratory organs comprised 87.9% of all examinations.

TABLE 2-2 NUMBER AND PROPORTION OF AUTOPSIES BY TYPE AND POPULATION GROUP (1994)

Autopsy type	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
<i>Cardio-respiratory organs only</i>	1 669	96.1	745	73.0	92	97.9	2 506	87.9
<i>Full autopsy</i>	66	3.8	275	26.9	2	2.1	343	12.0
<i>Not stated</i>	2	0.1	1	0.1	0	-	3	0.1
<i>Total</i>	1 737		1 021		94		2 852	

The age distributions of autopsies for 1994 are shown in Table 2-3 and Figure 2-1. The mean age at autopsy of black men was 38.7 years. The mean age of white men at autopsy was 61.3 years and for coloured men 60.1 years

TABLE 2-3 NUMBER AND PROPORTION OF AUTOPSIES BY AGE AND POPULATION GROUP (1994)

Age group (years)	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
<20	3	0.2	1	0.1	0	0.0	4	0.1
20-29	218	12.6	40	3.9	0	0.0	258	9.0
30-39	577	33.2	55	5.4	0	0.0	632	22.2
40-49	498	28.7	94	9.2	14	14.9	606	21.2
50-59	282	16.2	199	19.5	28	29.8	509	17.8
60-69	54	3.1	262	25.7	29	30.9	345	12.1
70-79	8	0.5	253	24.8	19	20.2	280	9.8
80+	4	0.2	104	10.2	3	3.2	111	3.9
<i>Unknown</i>	93	5.4	13	1.3	1	1.1	107	3.8
<i>Total</i>	1 737		1 021		94		2 852	

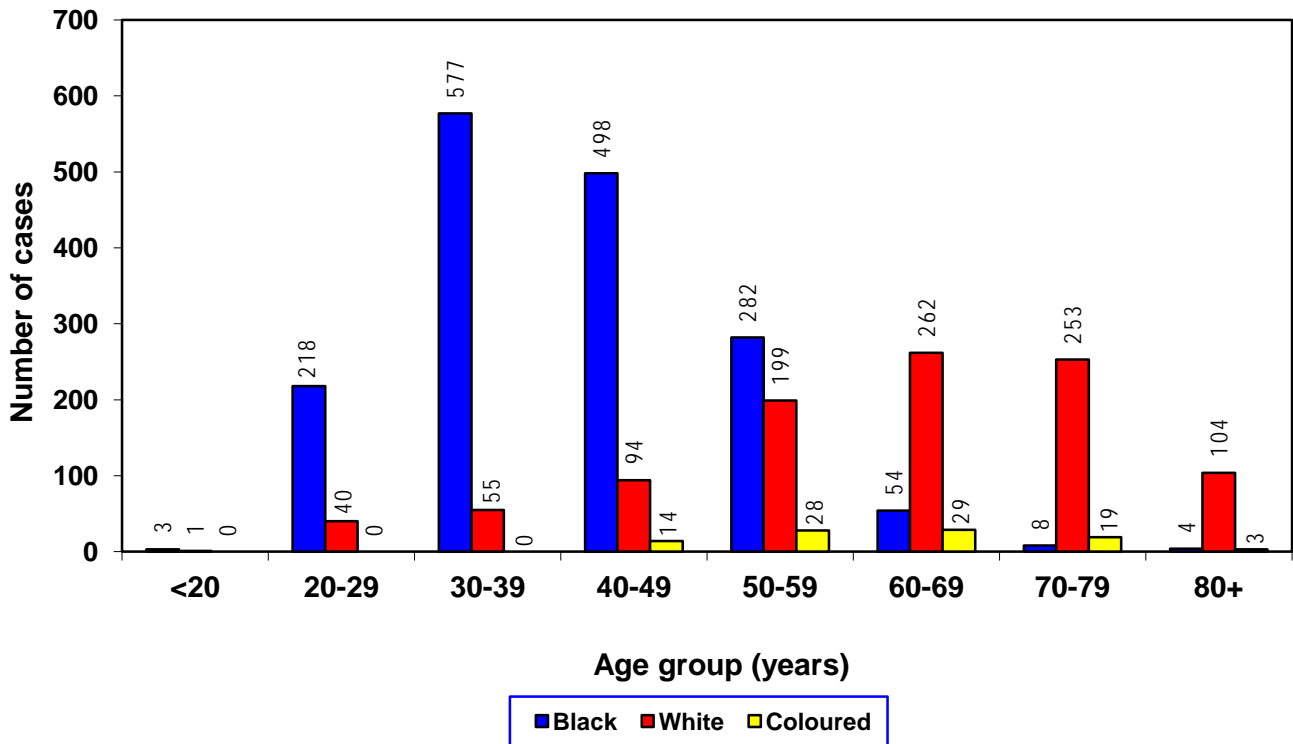


FIG 2-1 DISTRIBUTION OF AUTOPSIES BY AGE AND POPULATION GROUP (1994)

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 1994.

TABLE 2-4 NUMBER AND PROPORTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (1994)

Commodity	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Gold	1381	79.5	743	72.8	3	3.2	2127	74.6
Platinum	185	10.7	50	4.9	0	-	235	8.2
Coal	76	4.4	64	6.3	0	-	140	4.9
Asbestos	24	1.4	32	3.1	84	89.4	140	4.9
Iscor	3	0.2	37	3.6	0	-	40	1.4
Diamond	11	0.6	17	1.7	0	-	28	1.0
Copper	6	0.3	21	2.1	7	7.4	34	1.2
Other	5	0.3	4	0.4	0	-	9	0.3
Unknown	46	2.6	53	5.2	0	-	99	3.5
Total	1 737		1 021		94		2 852	

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

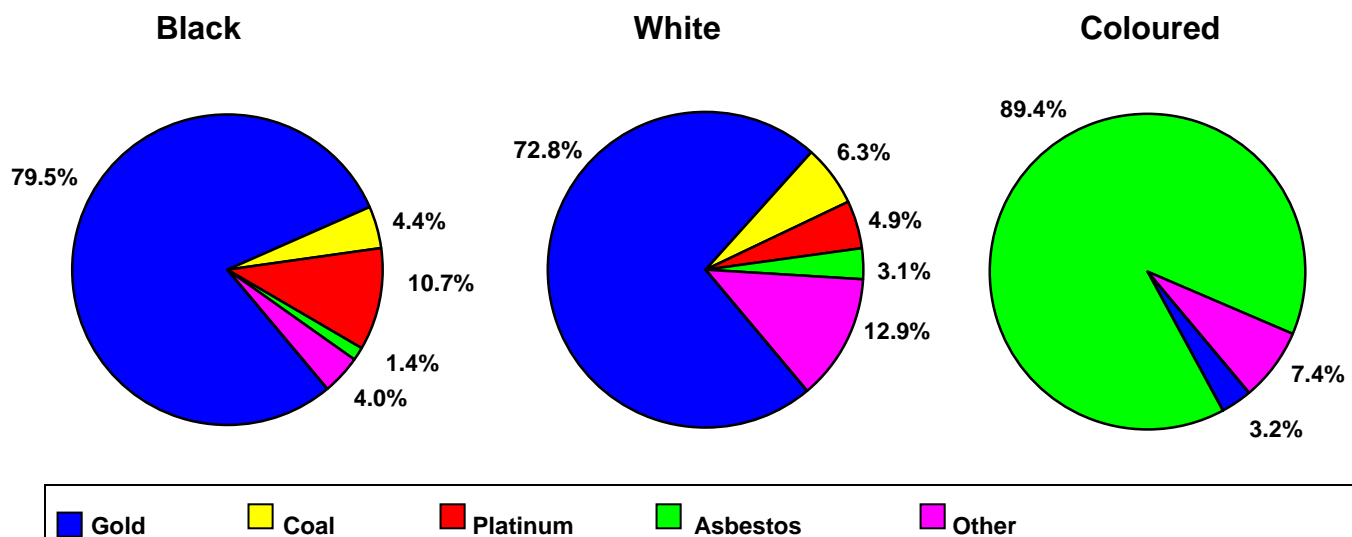
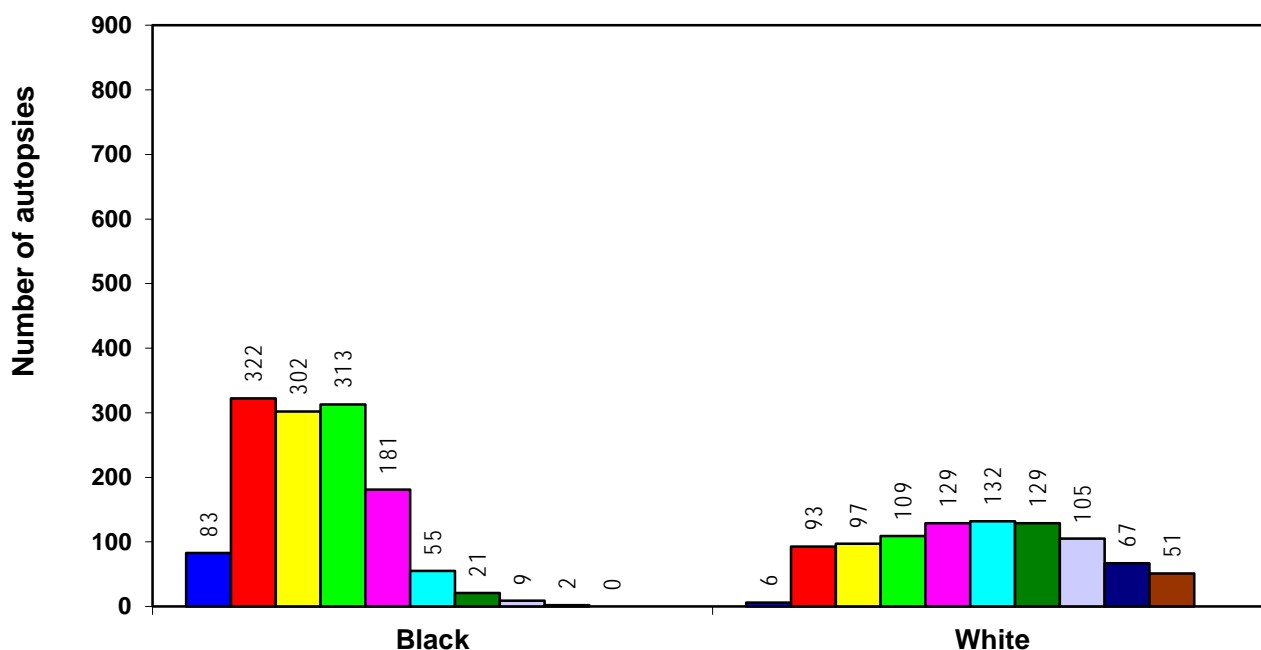


FIG 2-2 DISTRIBUTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (1994)

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 (1994)

Years of service	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
<1	83	4.8	6	0.6	0	-	89	3.1
1-5	322	18.5	93	9.1	21	22.3	436	15.3
6-10	302	17.4	97	9.5	20	21.3	419	14.7
11-15	313	18.0	109	10.7	23	24.5	445	15.6
16-20	181	10.4	129	12.6	10	10.6	320	11.2
21-25	55	3.2	132	12.9	7	7.4	194	6.8
26-30	21	1.2	129	12.6	3	3.2	153	5.4
31-35	9	0.5	105	10.3	1	1.1	115	4.0
36-40	2	0.1	67	6.6	2	2.1	71	2.5
41+	0	-	51	5.0	1	1.1	52	1.8
Unknown	449	25.8	103	10.1	6	6.4	558	19.6
Total	1 737		1 021		94		2 852	



Years of service:



FIG 2-3 DISTRIBUTION OF AUTOPSIES BY YEARS OF SERVICE AND POPULATION GROUP (1994)

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 (1994)

Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
Gold	1315	40.4	10.0	740	63.2	15.5
Platinum	177	39.9	9.8	50	54.1	14.0
Coal	74	42.3	11.8	64	60.1	15.2
Asbestos	24	51.0	12.2	32	63.2	10.0
Iscor	3	59.0	13.1	37	58.6	12.8
Diamond	11	46.4	8.2	17	61.7	14.1
Copper	6	49.3	10.7	21	60.3	13.7
Other	3	55.3	5.5	4	51.7	14.6
Unknown	31	49.5	13.4	43	59.5	14.8
Total	1 644	40.9	10.4	1 008	62.1	15.2

* Standard deviation

TABLE 2-7 MEAN DURATION OF SERVICE BY COMMODITY AND POPULATION GROUP (1994)

Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
<i>Gold</i>	1 112	10.6	7.0	706	23.3	11.7
<i>Platinum</i>	107	7.4	5.0	43	15.2	8.0
<i>Coal</i>	33	10.8	7.8	58	18.6	12.3
<i>Asbestos</i>	12	10.9	6.0	26	13.2	8.8
<i>Iscor</i>	1	8.0	-	29	18.0	10.8
<i>Diamond</i>	3	21.2	18.0	16	17.8	13.0
<i>Copper</i>	4	14.1	9.2	20	16.3	12.7
<i>Other</i>	4	9.4	7.4	4	12.5	10.6
<i>Unknown</i>	12	13.2	6.0	16	15.7	10.4
<i>Total</i>	1 288	10.4	7.0	918	21.7	11.8

* Standard deviation

SECTION 3 – ACTIVE TUBERCULOSIS

The distribution of active tuberculosis (TB) by anatomical site is presented in Figure 3-1 (n=265). Active pulmonary TB (PTB) was diagnosed in 7.5% (n=213) of all cases autopsied in 1994. Most of the men with PTB were black (87.8%; 187 cases), 8.0% (17 cases) were white and 4.2% (9 cases) were coloured.

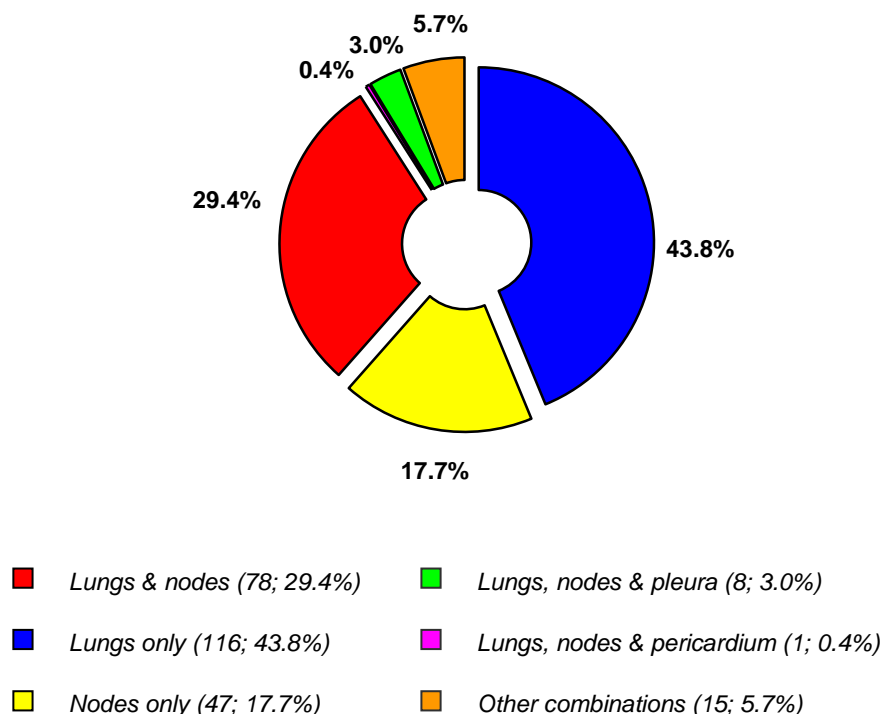


FIG 3-1 DISTRIBUTION OF ACTIVE TB BY SITE (1994)

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 (87.4%) came from the gold mining industry (74.6% of all autopsy cases came from that commodity).

TABLE 3-1 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY COMMODITY AND POPULATION GROUP (1994)

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	173	125	13	17	0	-	186	87
Platinum	7	38	0	-	0	-	7	30
Coal	4	53	0	-	0	-	4	29
Asbestos	2	83	0	-	8	95	10	71
Copper	0	-	1	48	1	143	2	59
Other	0	-	1	250	0	-	1	111
Unknown	1	22	2	38	0	-	3	30
Total	187	108	17	17	9	96	213	75

The age distribution of cases with active PTB is shown in Table 3-2. Most of the cases were aged between 20 and 69 years (195 cases; 91.5%).

TABLE 3-2 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY AGE AND POPULATION GROUP (1994)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	11	50	1	25	0	-	12	47
30-39	56	97	1	18	0	-	57	90
40-49	61	122	1	11	2	143	64	106
50-59	42	149	4	20	1	36	47	92
60-69	7	130	4	15	4	138	15	43
70-79	1	125	3	12	2	105	6	21
80+	0	-	3	29	0	-	3	27
Unknown	9	97	0	-	0	-	9	84
Total	187	108	17	17	9	96	213	75

SECTION 4 – SILICOSIS

Silicotic nodules were found in the lungs of 491 cases (17.2% of all autopsies), 95.3% of which came from the gold mining industry. Of all cases of silicosis, occasional silicotic nodules were found in 37.9% of cases, a few in 24.4%, a moderate number in 23.8% and a large number in 13.9%.

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 (1994)

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	257	186	211	284	0	-	468	220
Platinum	4	22	0	-	0	-	4	17
Coal	1	13	4	63	0	-	5	36
Asbestos	0	-	1	31	0	-	1	7
Iscor	0	-	2	54	0	-	2	50
Diamond	1	91	1	59	0	-	2	71
Copper	0	-	1	48	0	-	1	29
Other	1	200	0	-	0	-	1	111
Unknown	2	43	5	94	0	-	7	71
Total	266	153	225	220	0		491	172

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 (1994)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	4	22	1	30	0	-	5	23
30-39	41	87	0	-	0	-	41	81
40-49	112	278	4	71	0	-	116	252
50-59	74	338	30	216	0	-	104	290
60-69	10	294	56	298	0	-	66	296
70-79	2	500	85	434	0	-	87	435
80+	1	500	34	366	0	-	35	368
Unknown	13	197	1	333	0	-	14	203
Total	257	186	211	284	0		468	220

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 (1994)

Years of service	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
<1	7	92	0	-	0	-	7	88
1-5	33	124	4	66	0	-	37	113
6-10	25	99	5	75	0	-	30	94
11-15	59	217	15	246	0	-	74	222
16-20	66	393	19	204	0	-	85	324
21-25	26	520	43	384	0	-	69	426
26-30	3	176	45	402	0	-	48	372
31-35	4	500	44	494	0	-	48	495
36-40	0	-	20	328	0	-	20	313
41+	0	-	16	348	0	-	16	348
Unknown	34	126	0	-	0	-	34	111
<i>Total</i>	257	186	211	284	0		468	220

SECTION 5 – OTHER PNEUMOCONIOSES

MASSIVE FIBROSIS

There were 32 (1.1%) cases of massive fibrosis (19 black and 13 white). Thirty one cases of massive fibrosis were from gold and for one case the commodity was not known.

COAL WORKERS' PNEUMOCONIOSIS

There were 20 (0.7%) cases of coal workers' pneumoconiosis of which 16 cases were from the coal, two from the gold and one was from the asbestos mining industry. For one case the commodity was not known.

MIXED DUST PNEUMOCONIOSIS

There were 40 (1.4%) cases of mixed dust pneumoconiosis. Thirty three cases came from the gold, two from copper and one each from the platinum, asbestos, diamond and other mining industries. For one case the commodity was not known.

ASBESTOSIS AND PLEURAL PLAQUES

There were 88 cases of asbestosis of which 59.1% (n=52) had slight, 32.9% (n=29) moderate and 8.0% (n=7) marked fibrosis. Of these, 63 (71.6%) had worked in the asbestos mining industry at some time in their lives. There were 37 cases that had asbestos plaques and 18 (48.6%) 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 (1994)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
30-39	5	9	0	-	0	-	5	8
40-49	5	10	1	11	5	357	11	18
50-59	5	18	4	20	9	321	18	35
60-69	5	93	13	50	15	517	33	96
70-79	0	-	9	36	10	526	19	68
80+	1	250	1	10	0	-	2	18
<i>Total</i>	<i>21</i>	<i>12</i>	<i>28</i>	<i>27</i>	<i>39</i>	<i>415</i>	<i>88</i>	<i>31</i>

SECTION 6 – EMPHYSEMA

There were 582 cases of emphysema, the extent of which was mild in 59.8% (n=348), moderate in 33.5% (n=195) and marked in 6.7% (n=39). 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 (1994)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	0	-	1	25	0	-	1	4
30-39	19	33	1	18	0	-	20	32
40-49	42	84	16	170	2	143	60	99
50-59	52	184	81	407	11	393	144	283
60-69	14	259	128	489	11	379	153	443
70-79	2	250	133	526	8	421	143	511
80+	1	250	50	481	1	333	52	468
Unknown	3	32	5	385	1	1000	9	84
Total	133	77	415	406	34	362	582	204

The majority of black and white men with emphysema were from the gold mining industry (70.6%, n=411) (Table 6-2).

TABLE 6-2 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY COMMODITY AND POPULATION GROUP (1994)

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	98	71	312	420	1	333	411	193
Platinum	8	43	17	340	0	-	25	106
Coal	10	132	20	313	0	-	30	214
Asbestos	5	208	13	406	29	345	47	336
Iscor	1	333	19	514	0	-	20	500
Diamond	2	182	8	471	0	-	10	357
Copper	2	333	7	333	4	571	13	382
Other	0	-	1	250	0	-	1	111
Unknown	7	152	18	340	0	-	25	253
Total	133	77	415	406	34	362	582	204

TABLE 6-3 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY YEARS OF SERVICE AND POPULATION GROUP (1994)

Years of service	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
<1	5	60	2	333	0	-	7	79
1-5	13	40	24	258	7	333	44	101
6-10	17	56	29	299	5	250	51	122
11-15	31	99	45	413	7	304	83	187
16-20	20	110	59	457	7	700	86	269
21-25	11	200	58	439	2	286	71	366
26-30	3	143	67	519	1	333	71	464
31-35	2	222	49	467	0	-	51	443
36-40	1	500	36	537	1	500	38	535
41+	0	-	21	412	1	1000	22	423
Unknown	30	67	25	243	3	500	58	104
<i>Total</i>	133	77	415	406	34	362	582	204

SECTION 7 – MESOTHELIOMA

There were 21 cases of mesothelioma in 1994.

TABLE 7-1 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY AGE AND POPULATION GROUP (1994)

Age group (years)	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
30-39	1	16.7	0	-	0	-	1	4.8
40-49	2	33.3	0	-	3	60.0	5	23.8
50-59	2	33.3	3	30.0	0	-	5	23.8
60-69	1	16.7	4	40.0	2	40.0	7	33.3
70-79	0	-	3	30.0	0	-	3	14.3
<i>Total</i>	6		10		5		21	

The distribution of mesothelioma by commodity and population group is presented in Table 7.2. Ten (47.6%) had worked in the asbestos mining industry.

TABLE 7-2 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY COMMODITY AND POPULATION GROUP (1994)

Commodity	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
<i>Gold</i>	0	-	2	20.0	0	-	2	9.5
<i>Platinum</i>	0	-	1	10.0	0	-	1	4.8
<i>Coal</i>	1	16.7	0	-	0	-	1	4.8
<i>Asbestos</i>	3	50.0	2	20.0	5	100.0	10	47.6
<i>Diamond</i>	1	16.7	0	-	0	-	1	4.8
<i>Other</i>	1	16.7	0	-	0	-	1	4.8
<i>Unknown</i>	0	-	5	50.0	0	-	5	23.8
<i>Total</i>	6		10		5		21	

SECTION 8 – PRIMARY LUNG CANCER

Ninety two cases of primary lung cancer were found at autopsy, 22.8% of which were in black, 72.8% in white and 4.3% in coloured men. Most of the cases were small cell lung carcinoma (34.8%; n=32), followed by squamous lung carcinomas (29.3%; n=27), adeno carcinoma (14.1%; n=13), large cell lung carcinoma (13.0%; n=12) and broncho-alveolar carcinoma (8.7%; 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 (1994)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
30-39	1	2	0	-	0	-	1	2
40-49	10	20	4	43	1	71	15	25
50-59	8	28	11	55	1	36	20	39
60-69	2	37	25	95	0	-	27	78
70-79	0	-	19	75	2	105	21	75
80+	0	-	7	67	0	-	7	63
Unknown	0	-	1	77	0	-	1	9
Total	21	12	67	66	4	43	92	32

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 (1994)

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	14	10	43	58	0	-	57	27
Platinum	2	11	1	20	0	-	3	13
Coal	2	26	5	78	0	-	7	50
Asbestos	2	83	7	219	4	48	13	93
Iscor	0	-	3	81	0	-	3	75
Diamond	0	-	2	118	0	-	2	71
Copper	0	-	2	95	0	-	2	59
Unknown	1	22	4	75	0	-	5	51
Total	21	12	67	66	4	43	92	32

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 respiratory system were the most frequent (11.5%) overall. Black men had the highest proportion of unnatural causes of death (48.1%). In 25.4% of all cases, the cause of death was not stated.

TABLE 9-1 CLINICAL CAUSES OF DEATH BY POPULATION GROUP (1994)

System	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Respiratory	217	12.5	91	8.9	21	22.3	329	11.5
Cardio-vascular	65	3.7	184	18.0	17	18.1	266	9.3
Central Nervous System	66	3.8	23	2.3	6	6.4	95	3.3
Gastro-intestinal	65	3.7	38	3.7	8	8.5	111	3.9
Genito-urinary	35	2.0	34	3.3	1	1.1	70	2.5
Haematological	16	0.9	11	1.1	1	1.1	28	1.0
Unnatural	835	48.1	181	17.7	11	11.7	1027	36.0
Miscellaneous	114	6.6	83	8.1	5	5.3	202	7.1
Unknown	324	18.7	376	36.8	24	25.5	724	25.4
Total	1 737		1 021		94		2 852	

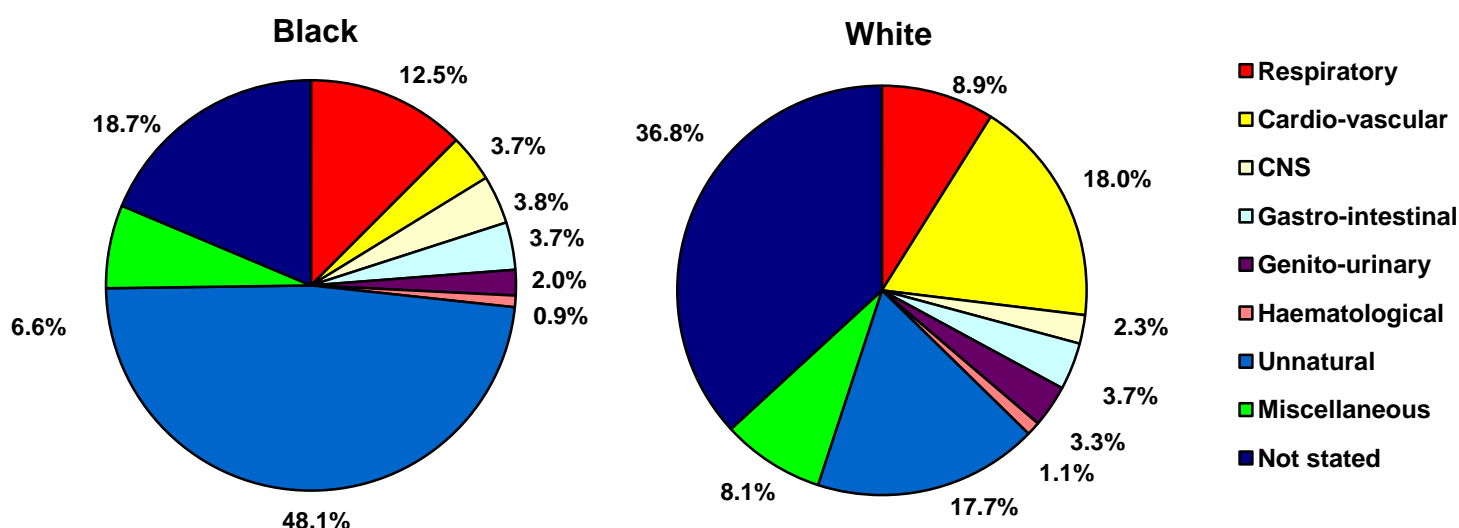


FIGURE 9-1 CLINICAL CAUSE OF DEATH AS STATED BY THE CLINICIANS WHO SUBMIT THE ORGANS OF THE DECEASED TO THE NIOH (1994)