



**NATIONAL HEALTH
LABORATORY SERVICE**

NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH

Pathology Division Surveillance Report

Demographic Data and Disease Rates for January to December 1987

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EXECUTIVE SUMMARY

During 1987, 3 840 cases came to autopsy at the NIOH. Of these, 67.6% were black men, 30.4% were white and 2.0% were coloured.

Overall disease rates (per 1000 autopsies) for 1987 are shown in Figure 1.

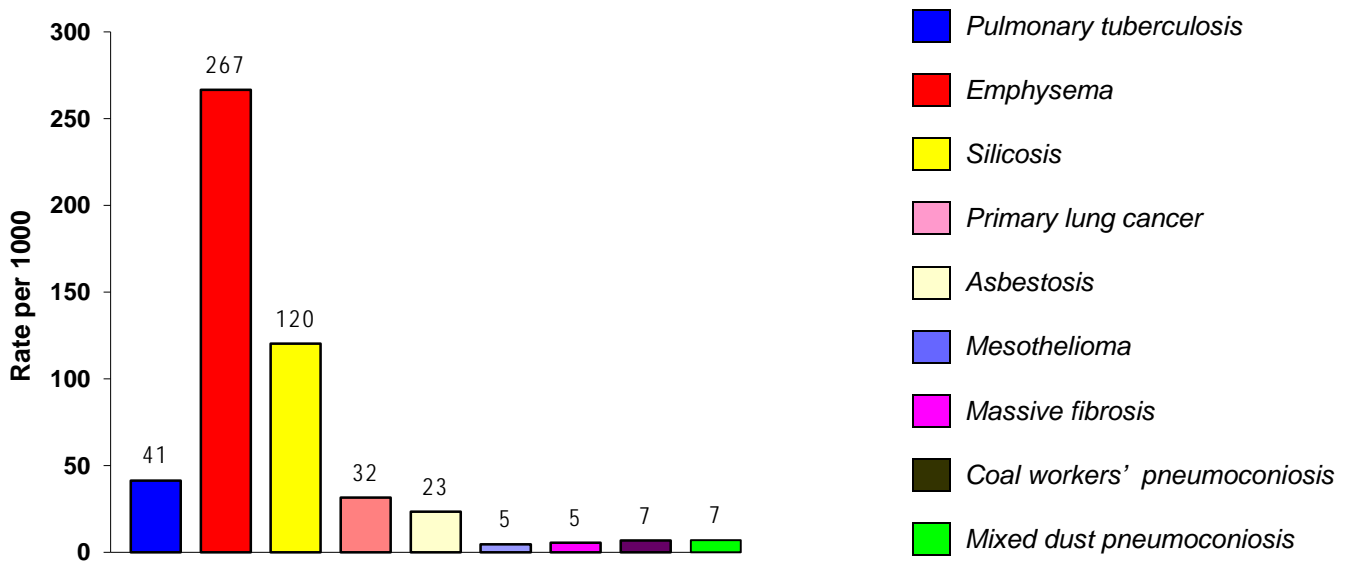


FIG 1 OVERALL DISEASE RATES FOR 1987

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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 1987. 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 1987 is presented in Table 2-1.

TABLE 2-1 DISTRIBUTION OF AUTOPSIES BY YEAR AND POPULATION GROUP (1987)

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
Total	29 485	66	14 474	33	550	1	1		44 510

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 1987. Autopsies of only the cardio-respiratory organs comprised 84.9% of all examinations.

TABLE 2-2 NUMBER AND PROPORTION OF AUTOPSIES BY TYPE AND POPULATION GROUP (1987)

Autopsy type	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Cardiorespiratory organs only	2 422	93.4	761	65.2	76	97.4	3259	84.9
Full autopsy	149	5.7	397	34.0	2	2.6	548	14.3
Not stated	23	0.9	10	0.9	0	-	33	0.9
Total	2 594		1 168		78		3 840	

The age distributions of autopsies for 1987 are shown in Table 2-3 and Figure 2-1. The mean age at autopsy of black men was 35.5 years. The mean age of white men at autopsy was 58.6 years and for coloured men 62.4 years

TABLE 2-3 NUMBER AND PROPORTION OF AUTOPSIES BY AGE AND POPULATION GROUP (1987)

Age group (years)	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
<20	15	0.6	4	0.3	0	-	19	0.5
20-29	788	30.4	69	5.9	0	-	857	22.3
30-39	798	30.8	84	7.2	3	3.8	885	23.0
40-49	489	18.9	132	11.3	12	15.4	633	16.5
50-59	327	12.6	211	18.1	18	23.1	556	14.5
60-69	74	2.9	320	27.4	18	23.1	412	10.7
70-79	9	0.3	270	23.1	15	19.2	294	7.7
80+	0	-	68	5.8	12	15.4	80	2.1
Unknown	94	3.6	10	0.9	0	-	104	2.7
Total	2 594		1 168		78		3 840	

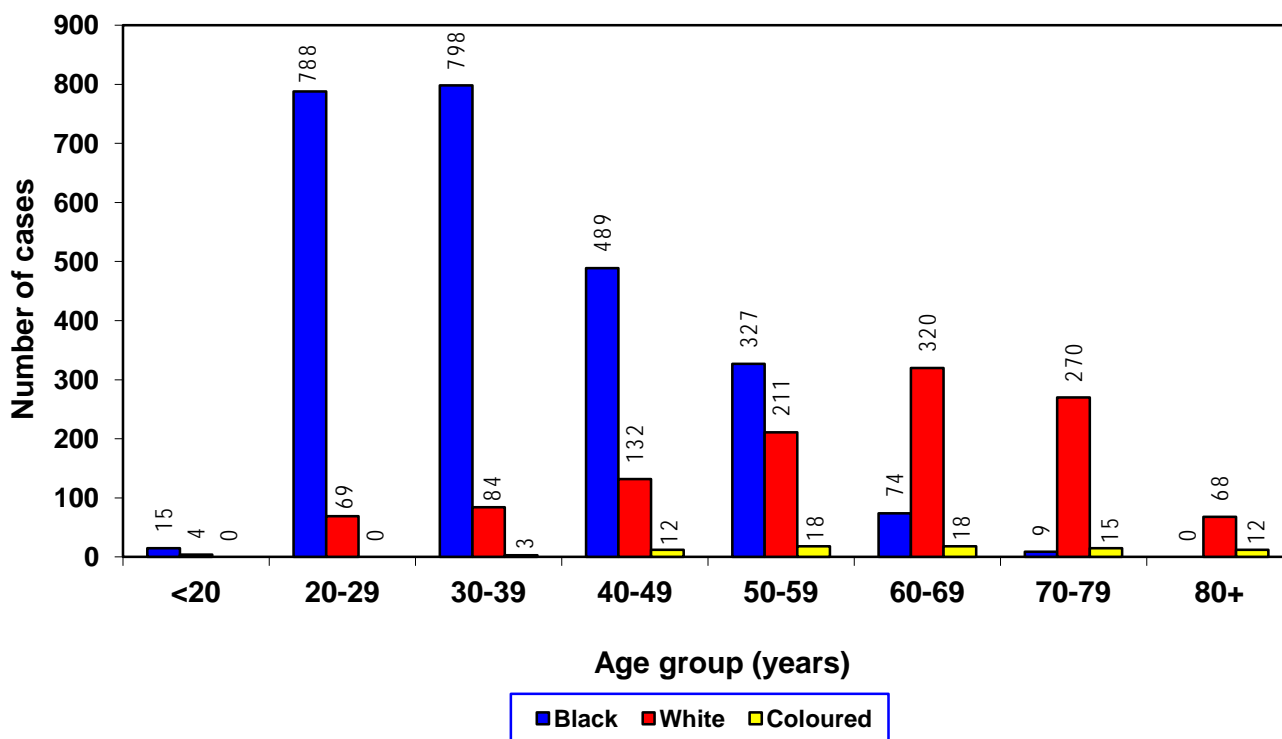


FIG 2-1 DISTRIBUTION OF AUTOPSIES BY AGE AND POPULATION GROUP (1987)

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 1987.

TABLE 2-4 NUMBER AND PROPORTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (1987)

Commodity	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Gold	2 024	78.0	888	76.0	2	2.6	2 914	75.9
Platinum	193	7.4	35	3.0	0	-	228	5.9
Coal	249	9.6	68	5.8	0	-	317	8.3
Asbestos	27	1.0	28	2.4	71	91.0	126	3.3
Iscor	6	0.2	62	5.3	0	-	68	1.8
Diamond	11	0.4	15	1.3	0	-	26	0.7
Copper	9	0.3	19	1.6	2	2.6	30	0.8
Other	7	0.3	5	0.4	1	1.3	13	0.3
Unknown	68	2.6	48	4.1	2	2.6	118	3.1
Total	2 594		1 168		78		3 840	

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

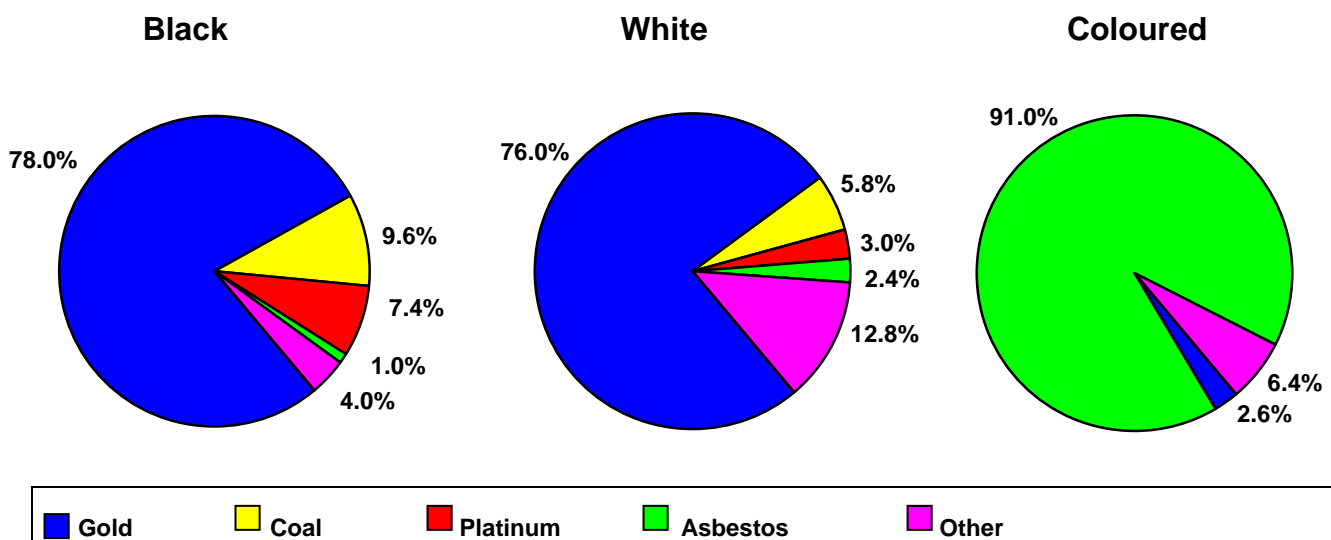
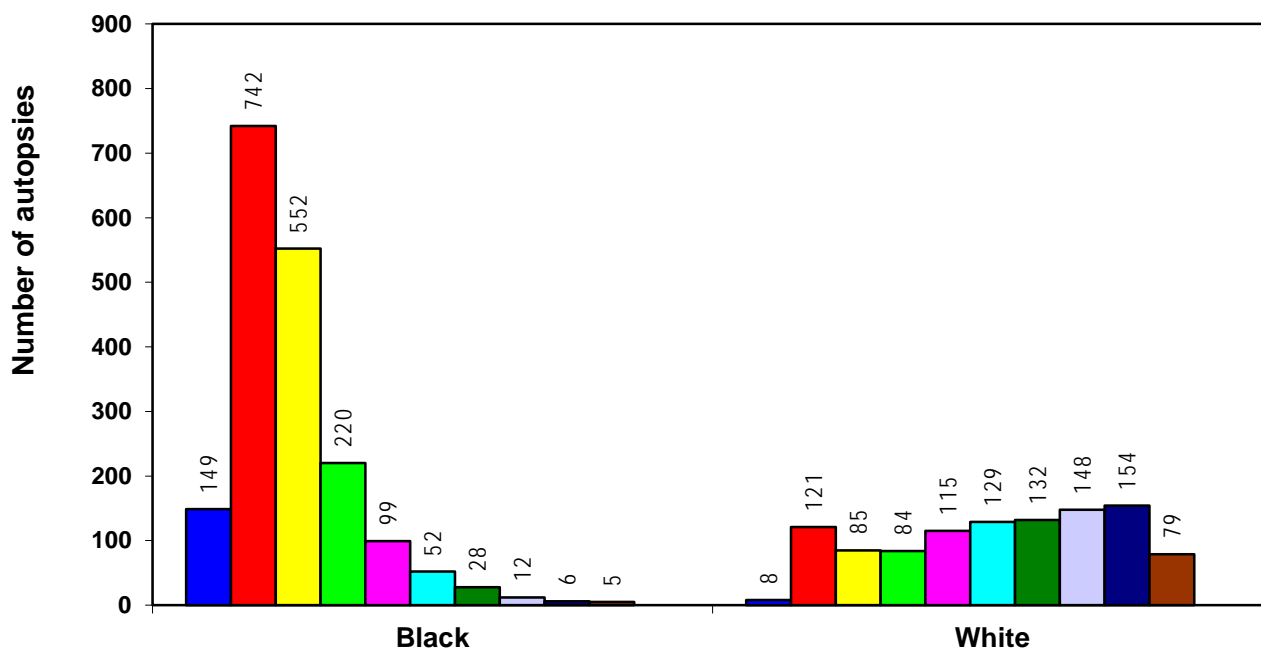


FIG 2-2 DISTRIBUTION OF AUTOPSIES BY COMMODITY AND POPULATION GROUP (1987)

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 (1987)

Years of service	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
<1	149	5.7	8	0.7	3	3.8	160	4.2
1-5	742	28.6	121	10.4	13	16.7	876	22.8
6-10	552	21.3	85	7.3	15	19.2	652	17.0
11-15	220	8.5	84	7.2	9	11.5	313	8.2
16-20	99	3.8	115	9.8	8	10.3	222	5.8
21-25	52	2.0	129	11.0	10	12.8	191	5.0
26-30	28	1.1	132	11.3	5	6.4	165	4.3
31-35	12	0.5	148	12.7	3	3.8	163	4.2
36-40	6	0.2	154	13.2	3	3.8	163	4.2
41+	5	0.2	79	6.8	2	2.6	86	2.2
Unknown	729	28.1	113	9.7	7	9.0	849	22.1
Total	2 594		1 168		78		3 840	



Years of service:

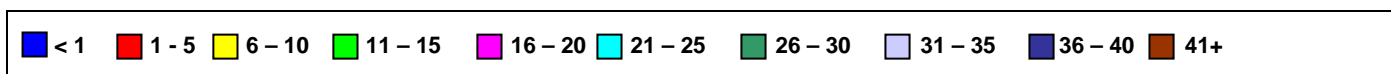


FIG 2-3 DISTRIBUTION OF AUTOPSIES BY YEARS OF SERVICE AND POPULATION GROUP (1987)

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 (1987)

Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
Gold	1 956	36.3	11.0	888	59.9	16.1
Platinum	191	36.0	11.0	35	55.1	13.9
Coal	239	38.1	11.5	68	54.9	16.3
Asbestos	23	46.8	14.8	28	57.4	11.8
Iscor	5	45.6	10.9	62	58.7	13.6
Diamond	8	40.6	10.6	15	58.9	13.1
Copper	8	44.9	15.3	18	60.2	13.1
Other	7	43.4	8.2	5	63.2	7.2
Unknown	63	43.8	12.7	39	54.7	14.9
Total	2 500	36.8	11.2	1 158	59.1	15.7

* Standard deviation

TABLE 2-7 MEAN DURATION OF SERVICE BY COMMODITY AND POPULATION GROUP (1987)

Commodity	Black			White		
	N	Mean (years)	SD*	N	Mean (years)	SD*
Gold	1 526	7.7	7.0	829	25.3	13.0
Platinum	155	5.1	5.3	34	14.7	8.3
Coal	137	9.0	7.0	55	23.0	12.1
Asbestos	11	12.8	10.2	24	13.7	9.7
Iscor	1	24	-	54	21.6	11.4
Diamond	2	13.5	14.8	15	16.8	8.8
Copper	1	2.3	-	17	16.3	11.6
Other	7	7.7	4.7	5	25.0	10.1
Unknown	25	9.3	7.3	22	14.1	9.1
Total	1 865	7.7	7.0	1 055	23.9	12.9

* Standard deviation

SECTION 3 – ACTIVE TUBERCULOSIS

The distribution of active tuberculosis (TB) by anatomical site is presented in Figure 3-1 (n=217). Active pulmonary TB (PTB) was diagnosed in 4.1% (n=159) of all cases autopsied in 1987. Most of the men with PTB were black (83.6%; 133 cases), 7.5% (12 cases) were white and 8.8% (14 cases) were coloured.

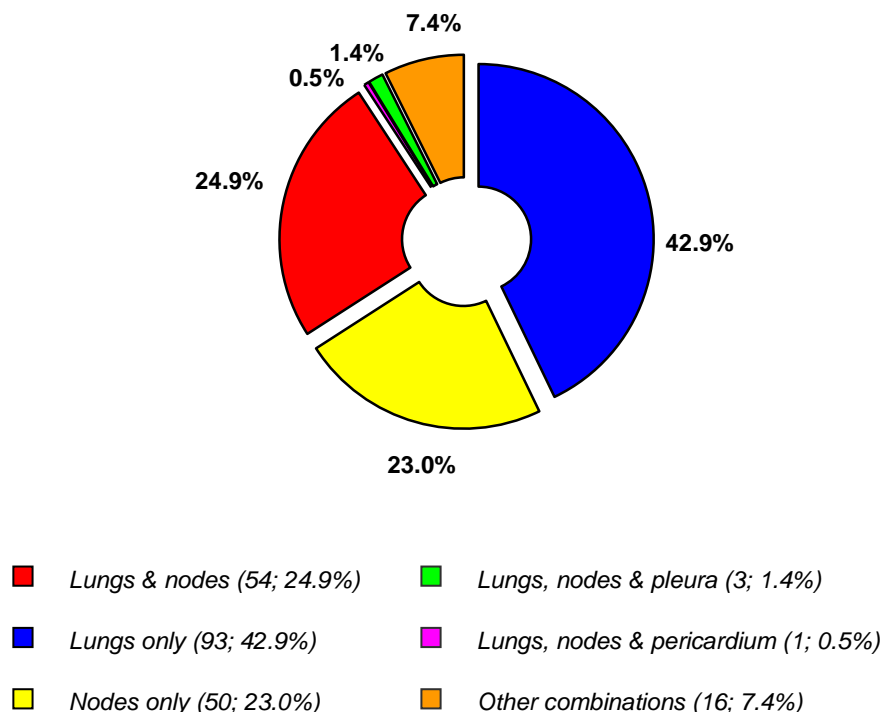


FIG 3-1 DISTRIBUTION OF ACTIVE TB BY SITE (1987)

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 (73.6%) came from the gold mining industry (75.9% of all autopsy cases came from that commodity).

TABLE 3-1 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY COMMODITY AND POPULATION GROUP (1987)

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	111	55	8	9	0	-	119	41
Platinum	3	16	0	-	0	-	3	13
Coal	10	40	0	-	0	-	10	32
Asbestos	3	111	2	71	12	169	17	135
Iscor	1	167	0	-	0	-	1	15
Diamond	1	91	1	67	0	-	2	77
Copper	0	-	0	-	1	500	1	33
Other	1	143	0	-	0	-	1	77
Unknown	3	44	1	21	1	500	5	42
Total	133	51	12	10	14	179	159	41

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 (139 cases=90.6%).

TABLE 3-2 NUMBER OF CASES AND PREVALENCE OF ACTIVE PTB BY AGE AND POPULATION GROUP (1987)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	13	16	0	-	0	-	13	15
30-39	39	49	1	12	2	667	42	47
40-49	34	70	2	15	1	83	37	58
50-59	31	95	2	9	2	111	35	63
60-69	10	135	4	13	3	167	17	41
70-79	1	111	1	4	4	267	6	20
80+	0	-	2	29	2	167	4	50
Unknown	5	53	0	-	0	-	5	48
Total	133	52	12	10	14	179	159	41

SECTION 4 – SILICOSIS

Silicotic nodules were found in the lungs of 462 cases (12.0% of all autopsies), 90.5% of which came from the gold mining industry. Of all cases of silicosis, occasional silicotic nodules were found in 44.1% of cases, a few in 30.4%, a moderate number in 16.4% and a large number in 9.0%.

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 (1987)

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	215	106	203	229	0	-	418	143
Platinum	5	26	2	57	0	-	7	31
Coal	8	32	3	44	0	-	11	35
Asbestos	1	37	4	143	0	-	5	40
Iscor	0	-	2	32	0	-	2	29
Diamond	0	-	2	133	0	-	2	77
Copper	2	222	2	105	0	-	4	133
Unknown	5	74	8	167	0	-	13	110
Total	236	91	226	193	0		462	120

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 (1987)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	9	14	0	-	0	-	9	13
30-39	45	70	0	-	0	-	45	64
40-49	78	207	8	95	0	-	86	186
50-59	66	284	31	209	0	-	97	255
60-69	13	250	73	296	0	-	86	287
70-79	0	-	64	282	0	-	64	276
80+	0	-	27	466	0	-	27	466
Unknown	4	59	0	-	0	-	4	59
Total	215	106	203	229	0		418	143

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 (1987)

Years of service	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
<1	4	33	0	-	0	-	4	31
1-5	22	37	1	12	0	-	23	34
6-10	50	109	0	-	0	-	50	96
11-15	52	284	7	123	0	-	59	246
16-20	25	305	12	150	0	-	37	228
21-25	14	341	25	278	0	-	39	298
26-30	7	292	32	311	0	-	39	307
31-35	2	200	47	353	0	-	49	343
36-40	0	-	50	352	0	-	50	340
41+	1	250	25	342	0	-	26	333
Unknown	38	76	4	68	0	-	42	75
<i>Total</i>	215	106	203	229	0		418	143

SECTION 5 – OTHER PNEUMOCONIOSES

MASSIVE FIBROSIS

There were 21 (0.5%) cases of massive fibrosis (12 black, 7 white and 2 coloured). Ten cases of massive fibrosis were from gold, 1 from coal and 4 from the asbestos mining industries. For 6 cases the commodity was not known.

COAL WORKERS' PNEUMOCONIOSIS

There were 26 (0.7%) cases of coal workers' pneumoconiosis of which 24 cases were from the coal mining industry, one case was from gold and one was from the asbestos mining industry.

MIXED DUST PNEUMOCONIOSIS

There were 27 (0.7%) cases of mixed dust pneumoconiosis. These cases came from the gold (n=22), coal (n=1), diamond (1) and other (1) mining industries. For two of the cases the commodity was not known.

ASBESTOSIS AND PLEURAL PLAQUES

There were 90 cases of asbestosis of which 64.4% (n=58) had slight, 28.9% (n=26) moderate and 6.7% (n=6) marked fibrosis. Of these, 66 (73.3%) had worked in the asbestos mining industry at some time in their lives. There were 30 cases that had asbestos plaques and 18 (60.0%) of these has 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 (1987)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
30-39	7	9	0	-	0	-	7	8
40-49	7	14	0	-	2	167	9	14
50-59	10	31	8	38	8	444	26	47
60-69	3	41	10	31	10	556	23	56
70-79	1	111	6	22	8	533	15	51
80+	0	-	1	15	7	583	8	100
Unknown	2	21	0	-	0	-	2	19
Total	30	12	25	21	35	449	90	23

SECTION 6 – EMPHYSEMA

There were 1 024 cases of emphysema, the extent of which was mild in 74.7% (n=765), moderate in 23.0% (n=236) and marked in 2.2% (n=23). 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 (1987)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
20-29	21	27	0	-	0	-	21	25
30-39	74	93	10	119	0	-	84	95
40-49	89	182	48	364	2	167	139	220
50-59	87	266	129	611	6	333	222	399
60-69	30	405	236	738	7	389	273	663
70-79	5	556	203	752	7	467	215	731
80+	0	-	49	721	8	667	57	713
Unknown	13	138	0	-	0	-	13	125
Total	319	123	675	578	30	385	1 024	267

The majority of black and white men with emphysema were from the gold mining industry (73.3%, n=751) (Table 6-2).

TABLE 6-2 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY COMMODITY AND POPULATION GROUP (1987)

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	218	108	533	600	0	-	751	258
Platinum	10	52	17	486	0	-	27	118
Coal	61	245	37	544	0	-	98	309
Asbestos	7	259	18	643	30	423	55	437
Iscor	1	167	27	435	0	-	28	412
Diamond	2	182	11	733	0	-	13	500
Copper	2	222	13	684	0	-	15	500
Other	0	-	1	200	0	-	1	77
Unknown	18	265	18	375	0	-	36	305
Total	319	123	675	578	30	385	1 024	267

TABLE 6-3 NUMBER OF CASES AND PREVALENCE OF EMPHYSEMA BY YEARS OF SERVICE AND POPULATION GROUP (1987)

Years of service	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
<1	8	54	3	375	0	-	11	69
1-5	37	50	28	231	4	308	69	79
6-10	62	112	31	365	7	467	100	153
11-15	43	195	45	536	2	222	90	288
16-20	17	172	73	635	4	500	94	423
21-25	14	269	88	682	4	400	106	555
26-30	7	250	89	674	1	200	97	588
31-35	3	250	104	703	1	333	108	663
36-40	1	167	122	792	3	1000	126	773
41+	1	200	55	696	1	500	57	663
Unknown	126	173	37	327	3	429	166	196
<i>Total</i>	319	123	675	578	30	385	1 024	267

SECTION 7 – MESOTHELIOMA

There were 18 cases of mesothelioma in 1987.

TABLE 7-1 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY AGE AND POPULATION GROUP (1987)

Age group (years)	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
40-49	3	75.0	1	20.0	4	44.4	8	44.4
50-59	0	-	3	60.0	3	33.3	6	33.3
60-69	0	-	0	-	1	11.1	1	5.6
70-79	0	-	1	20.0	1	11.1	2	11.1
Unknown	1	25.0	0	-	0	-	1	5.6
<i>Total</i>	4		5		9		18	

The distribution of mesothelioma by commodity and population group is presented in Table 7.2. Eleven (64.7%) had worked in the asbestos mining industry.

TABLE 7-2 NUMBER AND PROPORTION OF MESOTHELIOMA CASES BY COMMODITY AND POPULATION GROUP (1987)

Commodity	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Gold	1	25.0	1	20.0	0	-	2	11.1
Asbestos	2	50.0	1	20.0	8	88.9	11	61.1
Copper	0	-	0	-	1	11.1	1	5.6
Unknown	1	25.0	3	60.0	0	-	4	22.2
<i>Total</i>	4		5		9		18	

SECTION 8 – PRIMARY LUNG CANCER

One hundred and twenty one cases of primary lung cancer were found at autopsy, 23.1% of which were in black, 72.7% in white and 4.1% in coloured men. Most of the cases were small cell lung carcinomas (28.9%; n=35), followed by squamous lung carcinomas (26.4%; n=32), adeno carcinoma (20.7%; n=25), large cell lung carcinoma (18.2%; n=22), and broncho-alveolar carcinoma (5.8%; n=7)

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 (1987)

Age group (years)	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
30-39	2	3	2	24	1	333	5	6
40-49	9	18	4	30	0	-	13	21
50-59	9	28	15	71	1	56	25	45
60-69	5	68	34	106	0	-	39	95
70-79	2	222	28	104	1	67	31	105
80+	0	-	4	59	2	167	6	75
Unknown	1	11	1	100	0	-	2	19
Total	28	11	88	75	5	64	121	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 (1987)

Commodity	Black		White		Coloured		Total	
	N	Rate	N	Rate	N	Rate	N	Rate
Gold	20	10	66	74	0	-	86	30
Platinum	1	5	3	86	0	-	4	18
Coal	2	8	3	44	0	-	5	16
Asbestos	1	37	1	36	4	56	6	48
Iscor	1	167	6	97	0	-	7	103
Diamond	0	-	1	67	0	-	1	38
Copper	1	111	3	158	0	-	4	133
Other	0	-	1	200	1	1000	2	154
Unknown	2	29	4	83	0	-	6	51
Total	28	11	88	75	5	64	121	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 cardio-vascular system were the most frequent (13.3%) overall. Black men had the highest proportion of unnatural causes of death (66.5%). In 4.9% of all cases, the cause of death was not stated.

TABLE 9-1 CLINICAL CAUSES OF DEATH BY POPULATION GROUP (1987)

System	Black		White		Coloured		Total	
	N	%	N	%	N	%	N	%
Respiratory	187	7.2	158	13.5	27	34.6	372	9.7
Cardio-vascular	102	3.9	386	33.0	22	28.2	510	13.3
Central Nervous System	83	3.2	44	3.8	1	1.3	128	3.3
Gastro-intestinal	148	5.7	66	5.7	6	7.7	220	5.7
Genito-urinary	38	1.5	31	2.7	1	1.3	70	1.8
Haematological	29	1.1	9	0.8	0	-	38	1.0
Unnatural	1 725	66.5	260	22.3	8	10.3	1 993	51.9
Miscellaneous	118	4.5	71	6.1	9	11.5	198	5.2
Not stated	164	6.3	143	12.2	4	5.1	188	4.9
Total	2 594		1 168		78		3 840	

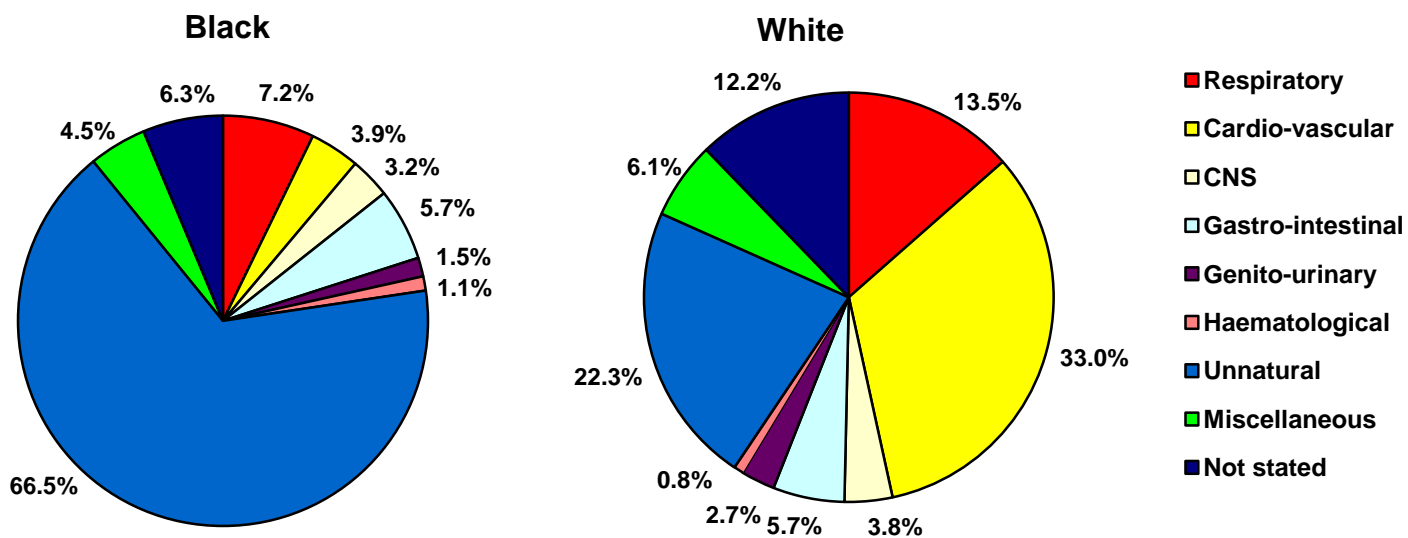


FIGURE 9-1 CLINICAL CAUSE OF DEATH AS STATED BY THE CLINICIANS WHO SUBMIT THE ORGANS OF THE DECEASED TO THE NIOH (1987)