Demographic data and disease rates in deceased South African miners

BACKGROUND
The Pathology Department of the National Institute for Occupational Health (NIOH) provides an autopsy service for miners and ex-miners to determine the presence of occupational lung disease, regardless of the clinical cause of death. Under the Occupational Diseases in Mines and Works Act (ODMWA, 1973) it is obligatory for the last attending doctor to remove the cardiorespiratory organs and send them for examination, provided the next of kin agrees. A detailed report of each case is sent to the Medical Bureau for Occupational Diseases (MBOD). Cases certified as having a compensatable disease are then referred to the Compensation Commissioner’s office, where payment of compensation is managed.

Since 1975 the pathological findings have been recorded on the PATHAUT database, a unique computerized source of information for research and surveillance. PATHAUT comprises autopsy data, occupational histories and the clinical causes of death. A report, describing the cases that have come to autopsy, is produced each year. A summary of the 2002 data is presented.

DEMOGRAPHIC DATA
During 2002, 2,518 cases were examined at the NIOH. Of these, 67% were black miners and 30% were white. The percentage of cases with most service in gold mining declined from 76% in 1999 to 68% in 2002. The percentage of platinum miners increased from 8% to 15% in this period.

Black miners coming to autopsy tend to be significantly younger than the white miners (mean ages were 44 and 63 years, respectively).

CLINICAL CAUSES OF DEATH
Diseases of the respiratory system were the most frequent (65%); the most common being tuberculosis (TB) and pneumonia. The rate of respiratory diseases in black miners increased from 58% in 1999 to 75% in 2002. Although black miners had the highest proportion of unnatural causes of death (9%), there has been a steady decline in the proportion of unnatural deaths in this group (17% in 1999).

PATHOLOGICAL FINDINGS
Overall disease rates (per 1000 autopsies) for 2002

- Emphysema: 214
- Pulmonary TB: 207
- Silicosis: 193
- Primary lung cancer: 36
- Asbestosis: 26

1. Active pulmonary tuberculosis (PTB)
PTB was diagnosed in 21% (521) of all cases; the lungs were extensively involved in most cases. The majority (93%) of cases were black miners. The rate of PTB has increased over the last decade, and is attributed to an increase in the PTB rate to 287/1000 in black miners. The rate of PTB increased particularly in black platinum miners to 383/1000 in 2002. The rate for black gold miners was 274/1000.

2. Silicosis
Silicotic nodules were found in the lungs of 486 cases (19% of all autopsies); 88% of these cases came from the gold mining industry. Most cases with silicosis had more than 10 years dust exposure although a small number had reportedly been exposed for fewer years. Most were older than 40 years of age but there were cases in the younger age groups.

Complicated silicosis, as evidenced by massive fibrosis (confluent nodules more than 20 mm in diameter), was uncommon (27 cases). Twenty-six cases were from the gold mining industry.

3. Emphysema
There were 538 cases of emphysema, the extent of which was mild in 74% (n=398), moderate in 24% (n=129) and marked in 2% (n=11). Although black miners had the highest proportion of unnatural causes of death (9%), there has been a steady decline in the proportion of unnatural deaths in this group (17% in 1999).

4. Asbestos related diseases
There were 65 cases of asbestosis, the majority of whom had a reported history of asbestos mining. The number of cases of mesothelioma (n=25) was similar to that in previous years with the highest proportion (58%) in asbestos miners.

5. Primary lung cancer
Ninety one cases of primary lung cancer were found; 22% in black and 70% in white miners (the mean age of white miners at autopsy is almost 20 years greater than that of black miners).