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An analysis of the burden of occupational lung disease in a random sample of former gold mineworkers in the Libode District of the Eastern Cape

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has also engendered a high prevalence of pneumoconiosis, both past and present. Katz has written, in relation to the period 1886 to 1910, that:

> "the mine owners' continued obsession with cost cutting strategies caused them to use mining methods which provoked accelerated silicosis after the cause and serious nature of the disease had been recognised." [28]

Katz argues that in addition to cutting the wages of black mineworkers, there was a concerted effort to increase productivity (colloquially known as 'speeding up'), for which the mineworkers paid a heavy price; as productivity accelerated, so too did the rates of silicosis. Katz quotes a contemporary newspaper report by Bottomley stating that:

> "a process of 'speeding up' has been instituted in order to keep the mills going and earn sufficient profits to pay the promised dividends ... There is no time to take adequate precautions. The men have to work at express speed and their health suffers." [29]

Smith notes that in the 1930s, mining regulations "held for white workers but seldom for black workers." The Workplace Information Group submission to the 1994 Commission of Inquiry into Safety and Health in the Mining Industry, suggests that pressure of production often still results in disregard for the health and safety provisions relating to dust control.[30]

Although cost-cutting measures are no longer so blatantly directed at reducing health-related expenditure, the basic tension between the people responsible for health matters and those concerned with the lowering of operating costs remains. The 1994 Commission of Enquiry into Safety and Health in the Mining Industry concluded that:

> "the Commission is of the opinion that dust levels have remained roughly the same over a period of about 50 years".[31]

In order to cover the costs of compensation, chapter 2, section 18 of the Occupational Diseases in Mines and Works Act (ODMWA)[32] establishes a Risk Committee which sets the levy that mines pay into the ODMWA Compensation Fund. The function of the committee is to ensure that the levy paid by a given mine relates to mineworkers' dust exposure, so that mines with high dust levels pay proportionately more. White argues that the representation of the Chamber of Mines on the Risk Committee has had the effect of minimising the industry's contributions to the compensation fund.[33] He comments that while minimising the

compensation levy makes only a modest direct contribution to lowering production costs, it results in considerable indirect savings to the industry. Erlich, White and Kerfoot expand on this point, stating that one of the most effective disincentives to allowing hazardous working conditions to prevail, is the cost directly borne by employers.[34] However, the cost of mining-related occupational disease is not being carried fully by the mining employers in South Africa. Consequently, the economic link between hazard and disease is rendered ineffective. It can be argued that the prevention of occupational disease is an implicit function of workers' compensation, and an inefficient system of compensation hinders disease prevention. Davies has written that the lack of occupational health surveillance facilities in the rural mine labour sending areas has resulted in failure to report cases of occupational lung disease in black former mineworkers to the MBOD.[35] In subsequent chapters, it will be shown that this failure to report occupational disease has resulted in an underestimate of the incidence and prevalence of such diseases which, in turn, has led to a reduction, in real terms, in the value of the dust levy since its inception. Furthermore, it will be argued that the ODMWA Compensation Fund is substantially under-funded when one considers the extent of the unpaid liabilty.

A recent study of silicosis prevalence in black South African gold mineworkers, revealed a prevalence of silicosis of 22 per cent (ILO $\geq$ 1/1) in a random sample of in-service workers over 40 years old.[36] It is well known that silicosis is a strong risk factor for tuberculosis. In chapter six of this thesis, the prevalence of silicosis among in-service mineworkers is compared with that found in ex-mineworkers. Here, it will suffice to note that the high prevalence of silicosis and the high morbidity from tuberculosis among in-service mineworkers, indicates that neither past nor present dust exposure levels in the South African gold mining industry are safe for mineworkers; and that these dust levels can be seen to be, in part, a consequence of the cost structure of this industry.

1.3.3 Gold mining and labour

The Witwatersrand reefs are often narrow, disjointed and faulted, presenting a major obstacle to mechanisation. This leads to a reliance on manual labour to work the narrow stopes. Given that it is necessary to mine on an extensive scale, this translates into the need for a very large labour force. Crush comments that:

> "if a low grade ore body like South Africa's had been discovered in countries like Canada,

Australia or the United states it would have been left in the ground because of the inability to mobilise the right kind of labour. Without migrants the world's largest supplier of gold would have been, at best, a minor producer and South Africa would be a very different place today". [37]

Initially, black labour for the gold mines was scarce, as peasants saw little to gain from mine work or as the Chairman of the Chamber of Mines put it in 1912:

"the native cares nothing if industries pine for want of labour when his crops and home brewed drink are plentiful."[38]

In practice, a combination of land wars and punitive taxes, followed by the 1913 Land Act, forced many black people off the land and into wage labour, especially on to the mines.[39] Until the late 1970s, the need for labour continued to be an overriding preoccupation of the gold mining industry and the gold mines were compelled to recruit widely throughout Southern Africa in order to satisfy the demand for labour.

Due to the high demand for labour, black workers were initially able to move to better paying mines, prompting mine owners to establish the Witwatersrand Native Labour Association (WNLA) and later the Native Recruiting Company (NRC). These recruiting agencies served to eliminate competition among mines for labour by monopsonistic recruiting practices. By eliminating competition among mines, the industry was able to lower the annual wages paid to black mineworkers from the equivalent of R78 in 1889 to R58 in 1897 (in 1972 Rands). In real terms, using 1938 as the base year, black earnings were no higher in 1969 and were possibly even lower, than they had been in 1911. For White workers, on the other hand, real cash earnings had increased by 70 per cent. WNLA and the NRC continue to exist in an amalgamated form and are currently known as The Employment Bureau of Africa (TEBA).[i]

1.3.4 Migrant mine labour

Migrant labour has been a central feature of employment for black workers on the South African gold mines for over a century. A combination of wages that were too low to support families, a lack of housing, and pass laws that specifically precluded black workers and their families from settling in urban areas, have promoted an oscillating form of labour migration,

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[i] TEBA recruitment records for the Libode district, Eastern Cape provide the sampling frame for this study.

characterised by the geographic separation of home and work and the movement of workers, without their families, between rural and urban areas. This is not to say that migrant labour is unique to South Africa, nor to its gold mining industry. Indeed, it is a common feature of many industrialising societies, signifying a transition from agrarian to industrial modes of production. What is unique about migrant labour in South Africa is its persistence, its centrality to the development of the mining industry, and its political and institutional form.[40] Crush writes that:

> "the South African mining industry, in co-operation with the British and Portuguese colonial governments created a regional labour market (or "labour empire") for mine labour in the late nineteenth and early twentieth centuries that included virtually all countries that now comprise the Southern African Development Community (SADC). Few parts of the sub-continent have been untouched by the involvement of young male migrants in mine labour in South Africa." [41]

It would be wrong to assume that mine labour recruiting methods and patterns in South Africa were static or shaped only by the interests of the mining companies and their recruiting agencies. The mine labour empire was a dynamic entity responsive to changes in political and economic circumstances in source and destination areas. Furthermore, it has been shown that the recruiting process was complex and strongly influenced by regional interests, the governments involved, indigenous leaders, indigenous customs and the actions of the recruits themselves.[42] In the last decade the minibus taxi industry and modern mining practices such as sub contracting have made it possible for migrant workers to visit their rural homes more often than before but the basic paradigm remains unchanged.

For one hundred years, migrant labour has been the dominant form of labour supply to the mines. Over time, it was extended into other industries and became central to the National Party government policy. Even the elimination of apartheid, the repeal of legislation impeding the stabilisation of the work force, and the advent of democracy in 1994, has left the migrant labour system substantially unchanged.

1.3.5 Health consequences of migrant labour

Anderson points out that black South Africans were little affected by tuberculosis until the transformation of South Africa by the discovery of minerals.[43] The role of gold mining and migrant labour in the spread of *Mycobacterium tuberculosis* in Southern Africa is well

documented.[44, 45] Smith discusses how labour migration initially led to an urban epidemic of tuberculosis, from where the disease spread into the rural areas.[46] At the same time, the lack of political rights for black workers limited their ability to campaign for health reforms. The 1912 Tuberculosis Commission reported that the distribution of tuberculosis in rural Southern Africa was directly related to the extent to which the population of the area was involved in the mine migrant labour system. Surveys in the Transkei, Ciskei and Basutoland (Lesotho) in the 1930s revealed that 72 per cent of all black workers applying for jobs on the mines had been infected with tuberculosis.[47] Holmes notes that migrant labour is inimical to efficient contact-tracing and the follow-up of defaulters required for effective tuberculosis control programs.[48] Packard describes how certain labour sending areas were more severely affected than others by the tuberculosis epidemic.[49] He argues that the degree to which a community was affected depended on the extent to which it was involved in migrant labour, the intensity of the exposure (the more remote the village, the smaller the chances of contact), the response to tuberculosis according to traditional health beliefs about tuberculosis (certain communities effectively quarantined tuberculous households), and the general health of and the ability of the community to resist infection. By the 1960s the Eastern Cape was particularly badly affected, as can be seen by comparison with the other labour sending areas shown in Table 1.1.[50]

Table 1.1 1964 data pertaining to incidence and prevalence of tuberculosis in various labour sending areas

Area	New cases per 1000	per cent tuberculin positive
Transkei	10.1	98.6
Lesotho	5.6	85.2
Mozambique	3.3	85.4
Malawi	2.1	75.2

Source: Laing, T. cited in Packard R. 1989.312.

Smith follows the well known argument that tuberculosis is usually associated with poverty and malnutrition and is often linked to social and economic change in society.[51] He also draws attention to the fact that in other industrialised countries, tuberculosis was brought under control as a result of improved social and economic conditions as well as preventive public health measures. Only in the 1950s did medical treatment become available, but prevention of

infection had been practised in England since the mid-19th century. Packard notes that South African tuberculosis control was based on medical segregation, which took as its cornerstone the belief that black people were particularly susceptible to disease, especially tuberculosis; and that disease in black mineworkers was fundamentally the manifestation of incomplete adjustment to 'civilisation'.[52] The focus of medical attention on black mineworkers by the mining employers, related to the detection and exclusion from the industry of those mineworkers who were unfit to work. Despite the fact that by 1950, curative treatment was available for tuberculosis, it was recognised as an occupational disease, and mine hospital beds were available, mineworkers continued to be sent home when they contracted the disease. Medical repatriation and recuperation in the labour reserves ran counter to accepted public health practice of the time, as initiated in the UK and practised in public health services provided to white people with tuberculosis in South Africa.

Smith states that two somewhat contradictory theories as to the reasons for the high rates of tuberculosis in mineworkers were used to blame the victims and their home environment rather than have mines assume the costs of improving mine living and working conditions in order to reduce transmission. The first ('virgin soil') theory argued that black mineworkers, without a history of exposure, were particularly susceptible to tuberculosis. The second ('recuperation') theory argued that migrancy enabled workers to recover when they returned to their rural homes. A policy that was medically and logically flawed and aimed at limiting the effects of tuberculosis through migrancy, was devised. Migrancy, it was said, gave workers the opportunity of recuperating in the labour reserves. This obviated the need to improve living and working conditions that would have involved costs to the mines. In a view that ran counter to the notion that recuperation in the rural setting was the appropriate tuberculosis control measure, 'responsibility' for the origin of infection was simultaneously shifted to the rural setting. The externalisation of responsibility for tuberculosis was also a key ideological pillar of the mining industry's medical policies. Thus, a 1927 article in the *Journal of the Medical Association of South Africa* concluded that:

> "it is the home not the place of business that dominates the spread and distribution of tuberculosis".[53]

This externalisation of responsibility for tuberculosis and perception of the labour sending areas as the source of infection, has continued into the present. In 1989, Cowie wrote that:

> "the apparently adequate management of tuberculosis disease in black South African gold miners has had no influence on the prevalence of disease ... because of the large infective pool that exists in recruitment areas the effective surveillance and treatment of the disease on the mines can never significantly influence the incidence of pulmonary tuberculosis." [54]

However, there is little evidence that management of tuberculosis on the mines is indeed adequate. A recent study of patient compliance with tuberculosis treatment at five medical stations of the Freegold Mines, where Directly Observed Therapy is practised, found that both programme compliance (dispensing the correct treatment) and patient compliance were extremely poor. Urine tests indicated that there was a high level of non-compliance and also that a large proportion of patients were taking the wrong medicine.[55]

The medical repatriation of all diseased and injured workers ensured that the epidemic of urban tuberculosis would quickly spread into the rural areas.[56] By 1925 there was a reservoir of tuberculosis in the Transkei and this disease was being fed back into the urban areas and onto the mines, a feedback loop that continues to this day. Official figures show that there were 7500 repatriations for tuberculosis between 1910 and 1912 alone. The impact on rural communities was highlighted by a follow-up study of mineworkers repatriated from Witwatersrand mines to the Transkei and Ciskei. It was found that of those medically repatriated between 1926 and 1927, 52 per cent were dead within two years and of those still alive, 50 per cent were judged incapable of working again.[57] As late as 1982, the senior TEBA medical representative reported that only 10 per cent of workers medically repatriated by TEBA were subsequently treated.[58] It is worth noting that while the mining industry was the first and largest industry to practice medical repatriation, this policy was also practised by other industries. By 1983, 1 per cent of the gold mining work force was being medically discharged annually and these men tended to be the older, more skilled workers.[59] Medical repatriation from the gold mines was stopped in 1985. This change in procedure was probably due to the rising economic cost of discharging workers, which had come to outweigh the costs of treating workers. In the five years before 1985, the reports of the Director of the MBOD show that more than 15 000 men were repatriated annually for tuberculosis alone. Another factor that may have contributed to medical repatriation being discontinued in 1985 may have been Dr. Cowie's studies. He showed that, contrary to a premis based on animal studies published in the 1930s (which showed that continued exposure to silica dust reduced the chance of recovery from tuberculosis) this was not so for black mineworkers served by the

Ernest Oppenheimer Hospital.[54] In these men, continued exposure to mine dust and return to underground work, (after diagnosis, the initiation of treatment and control of systemic symptoms), was not associated with a higher relapse rate that occurred in men who returned to work above ground.

A consequence of the migrant labour system and its ideology was that health service providers tended to regard black workers as temporary employees who would not work for long enough to develop dust-related diseases. Therefore, long-term occupational health services were not provided in labour sending areas.[60] Indeed, whilst the health services for black workers were devised to ensure that the labour force was fit enough to endure arduous working conditions, they were not designed to deal with detection of diseases such as silicosis with a long latent period. While it is debatable whether the perception of black mineworkers as temporary was ever valid, by the mid-1960s it was certainly not an accurate assessment of the labour histories of black workers where repeat contracts effectively made workers permanent in all respects, except for the regular contract that they were required to renew in terms of apartheid Pass Laws.

The lack of occupational health services has continued to be a problem for ex-mineworkers in the mine labour sending areas. When this study commenced in May 1995, there was only a fledgling Occupational Health Working group functioning under the auspices of the Eastern Cape Province Department of Health and Welfare. As a precursor to this study, a survey of the general practitioners, district surgeons and urban and rural hospitals in and around Umtata was conducted and it was found that none of those interviewed had undertaken an ODMWA medical examinations in the last twenty years. The ODMWA *de jure* provides medical benefit examinations for all ex-mineworkers but *de facto* access to these examinations is often not possible for workers based in the former Transkei. Failure to ensure adequate occupational health follow-up for black, migrant mineworkers is the focus of this thesis and will be dealt with at length in subsequent chapters.

The hypothesis guiding this study is that the failure to provide occupational lung disease surveillance systems in rural labour sending areas has lead to a widespread under-reporting of mining-related occupational lung disease in ex-mineworkers.

1.3.6 Stabilisation of migrant labour

In one important respect, labour recruiting to the mines has changed over time. Since 1987,

the total number of mine workers has declined significantly, with the loss of over 250 000 jobs.[61] Thus, while the migrant labour system has remained largely intact, the role of recruiting agencies has changed from having to draw in labour to having to ration the mining jobs that are available. Because of the large-scale retrenchments after 1987, an explicit policy of 'stabilising' the workforce has been developed. This has increasingly come to mean an adapted form of migrant labour management which provides employers with the advantages of a permanent labour force while maintaining the migrant status of employees in order to avoid the costs that would accrue if they were to be permanently housed together with their families. Crush has called this stabilised form of migrancy 'inflexible migrancy' and argues that it is reinforced by a lack of economic alternatives in rural labour sending communities and that it reduces industry costs relating to recruitment and transportation of workers.[62] Hence, migrant labour to the gold mines has been superficially modernised but in ways which still result in the externalisation of social, economic and health costs of mining away from the mining industry and onto rural labour sending communities.

Labour stabilisation has resulted in changes in length of service and age profiles of the black workforce. Figure 1.1 shows the increase, between 1979 and 1990, in the proportion of mineworkers in employment for more than ten years.[63] The National Centre for Occupational Health (NCOH) PATHAUT database of autopsies performed under the ODMWA on mineworkers (most of whom died in mine accidents while in service), also shows the increasing age profile of the black workforce. Whereas in 1988, 58 per cent of recorded ages at death were between 20 and 29 years, by 1992 this figure had declined to 19 per cent. The PATHAUT records show that the proportion of black gold mineworkers with more than ten years service prior to death, was 19 per cent in 1988, and rose to 35 per cent by 1992.[64,65]

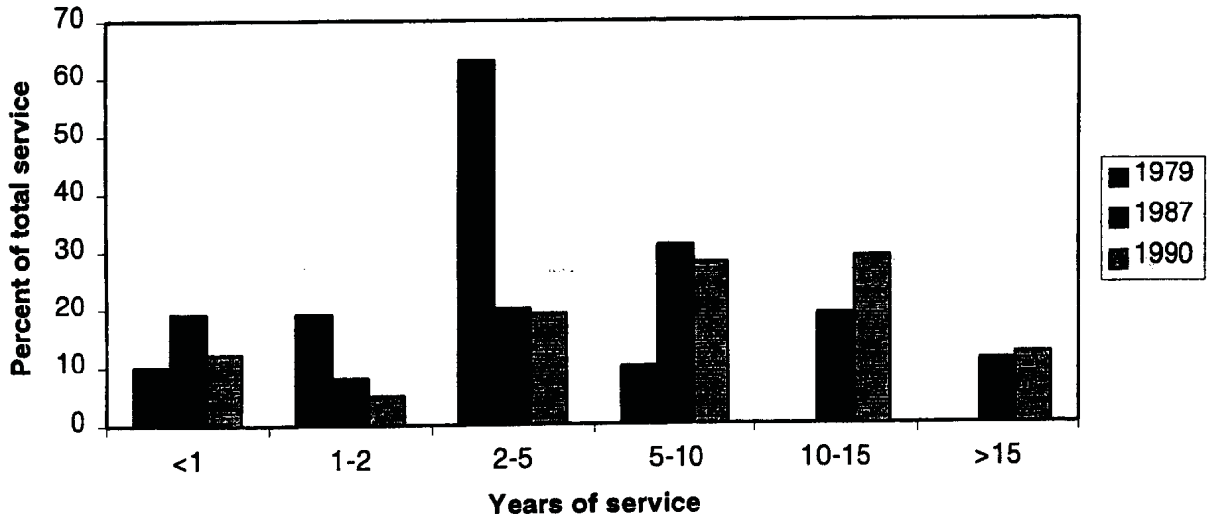


Figure 1.1 Proportion of mineworkers by duration of mine service (years) for 1979, 1987 and 1990

Source: PATHAUT database. NCOH, 1993[66]

In addition to the stabilisation of the workforce, the large-scale retrenchments that have taken place in the gold mining industry since 1987, have been based on the industrial relations principle of Last in First Out (LIFO) and this has also resulted in a trend towards an older, longer-serving workforce.

1.3.7 Health consequences of stabilisation

The policy of stabilisation of the workforce has resulted in the following changes that relate to occupational health: an increase in the average age, length of total service, length of each contract, and a reduction in the amount of time spent away from the mines between contracts. Significant increases in the length of exposure to silica and to noise, will result in an increase in the incidence of occupational lung disease and noise induced hearing loss. A third consequence of labour stabilisation is that an increase in the average age of mineworkers will result in a concomitant increase in susceptibility to tuberculosis. Another, possibly beneficial, consequence of labour stabilisation is that, given the long latent period that is a feature of pneumoconiosis, stabilisation will result in more disease manifesting while the worker is still in employment. This may mean that more occupational disease will be detected by mine occupational health services rather than remain undetected in the rural areas that do not have such health services and to which workers return after leaving mine employment.

1.3.8 Job reservation

Job reservation, the racially-based allocation of jobs, and one of the cornerstones of apartheid, originated in the mining industry and had significant economic and health consequences. Johnstone has argued that the cost structure of the mining industry was based on both a wage colour bar, which ensured preferential wages for white workers, and also a class-based colour bar, which ensured White domination of all skilled and most semi-skilled jobs.[67] White mineworkers formed industrial unions that were able to challenge mine employers but actively excluded black workers from their union activities. A theme that ran through much of the conflict between white labour and employers was over the efforts by employers to dilute the proportion of white miners to black labourers in order to further reduce costs. Job reservation, formalised in the Colour Bar Act of 1926, maintained the privilege of white workers and prevented upward mobility amongst black workers. Black mineworkers resented the job colour bar, which restricted their potential for occupational mobility and curtailed their earnings. In 1919, a spokesman for the Transvaal Native Congress noted that:

> "they feel they would like to have the opportunity of filling some responsible positions ... and they would like access to apprenticeships so that they could acquire skills."[68]

Speaking at the 1918 Native Grievances Commission, a black mineworker stated that black workers were:

> "like cattle that are put in a kraal and locked up there. They ought to be let out to go and find pastures somewhere, but the gate is closed".[69]

Job reservation by race was formally abolished in 1986.

1.3.9 Health consequences of job reservation

Job reservation placed a cap on the career prospects of black mineworkers so that even the most able men were prevented from being promoted into more senior positions that entailed lower silica exposure and improved living conditions. Indeed while the career trajectory for most white mineworkers involved a promotion out of dusty environments and away from the work face, the majority of black workers spent their entire working lives in high dust environments. This situation is illustrated by the fact that prior to 1986 promotion to the position of Team Leader (or 'Boss Boy' as it was known) was the best paid job a black mineworker could attain. The work of a Team Leader involves high dust exposure as it is

entirely undertaken at the stope face.

1.3.10 Differing political power of white and black mineworkers and its health consequences

It is important to note that, in the early decades of the Twentieth Century, both black and white mineworkers suffered greatly from occupational lung disease but that white mineworkers were able to organise and make successful demands around this issue while black mineworkers were not.[70] The alliance of organised white labour and Afrikaner nationalism after 1948 led to further improvements in wages and working conditions for white workers. White workers became increasingly involved in supervisory roles in which they were less exposed to health hazards and this, in turn, resulted in a substantial decline in the incidence of occupational disease and a corresponding increase in the time to certification. It is interesting to contrast occupational disease trends in black mineworkers with those of their white colleagues and to relate these to their relative political power. The differing disease trends are apparent even using the official records of the MBOD, which has been shown above to have a significant healthy worker effect and a bias against rural workers and diseases with long latency periods. Prior to 1990, MBOD reports provide a breakdown by racial group of numbers of workers certified with a given condition and also the average number of years to certification. The most recent MBOD report available is for 1992 and is notable only in that it provides almost no useful epidemiological data. Unlike the MBOD reports which preceed it, it does not distinguish certifications by race and it gives no information as to years of service prior to certification. The shift away from race-based statistics, which is to be welcomed as South African society normalises, in this instance works against obtaining useful epidemiological data and obscures epidemiological trends. Such data obscure the impact of silica exposure on black workers and help to disguise a disproportionate exposure to higher risk. The discussion of trends in occupational lung disease will thus concentrate on the period up to 1988.

The MBOD data for white workers indicate that the annual incidence of tuberculosis declined from 11/1000 in 1918 to 0.5/1000 in 1941 and remained stable at 0.5-1.0/1000 until 1953. The next available incidence data are for 1962, which show an increase to 3/1000. Leger argues that this increase is probably a result of the development of better diagnostic tools and the introduction by the MBOD of a diagnostic definition of tuberculosis (which included pleural effusions as evidence of tuberculosis), rather than a real increase in incidence of

disease.[71] Since 1962, the incidence of tuberculosis in white workers has declined steadily. By contrast, the tuberculosis incidence for black workers was 7/1000 in 1917, 3/1000 in 1935 and rose again to 5/1000 by 1953. Between 1965 and 1976, the incidence of the disease increased from 3 to 7/1000 and then rose to 10/1000 by 1985. Incidence data for 1994 show that the rate was then in the region of 11 per 1000[72].

The industry now faces the addition of HIV as a strong risk factor for tuberculosis. There has been a rapid rise in the incidence of tuberculosis amongst black gold mineworkers. Corbett found that tuberculosis incidence in HIV-negative men at the Ernest Openheimer Hospital, Freegold, was 7 per 1000, i.e. similar to the incidence at the same site in the 1980s, indicating that most of the recent increase in tuberculosis incidence rates in this workforce is HIV-related.[73] The circumstances in which migrant workers live in single-sex hostels, away from their families for the majority of their working lives, make black workers in the South African gold mining industry a very high risk group for HIV infection. In the same study, Corbettfound that the incidence of tuberculosis in HIV-positive men without silicosis was 36 per 1000 (i.e. HIV increased tuberculosis incidence by five times). The tuberculosis incidence rate in black gold mineworkers with both silicosis and HIV was 100 per 1000. Corbett argues that:

> "tuberculosis incidence rates in miners even before the arrival of the HIV epidemic would have been regarded as an unacceptable occupational health risk in many countries, especially as they occurred in association with a high prevalence of silicosis."[74]

Figure 1.2 shows the number of years from commencing minework to certification with tuberculosis by the MBOD, rose steadily in white workers from 5 years in 1918 to 15 years in 1935 and 18 years in 1968, but since then, has remained constant. The limited available data on years to certification for tuberculosis for black workers, indicate that the length of time involved has been significantly lower than for their white counterparts. In 1975, black workers averaged 7 years of service before certification. By 1988, this had risen to 10 years.

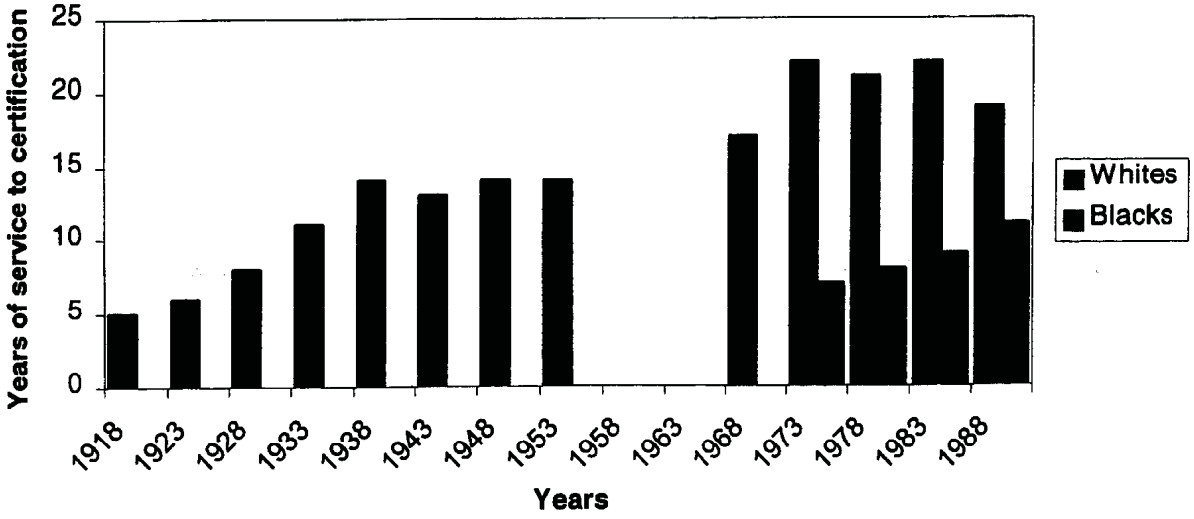


Figure 1.2 Gold mineworkers: average number of years of service prior to MBOD certification with tuberculosis

Source: Leger, JP:1995.

MBOD data relating to incidence of pneumoconiosis show that amongst white workers, incidence declined from 20-40/1000 in 1915 to 7/1000 in 1935, after which the incidence of the disease stabilised. There has been no major improvement since then. Leger states that there may have been a slight reduction in the incidence of pneumoconiosis in white workers since 1935 and that this seeming stabilisation, may in fact, be the result of better detection rates as well as the inclusion of new pneumoconioses (such as coal worker's pneumoconiosis) in the list of compensable conditions which may be masking this improvement. Prior to 1930, the incidence of pneumoconiosis among black workers varied between 2 and 6 cases per 1000 mineworkers, declined to 1 per 1000 in 1950, but increased again to 5 per 1000 in 1980 and 14 per 1000 in 1987.[75] The incidence of pneumoconiosis presented above may reflect poor data collection. The rise between 1950 and 1980 may have resulted from stabilisation in the workforce, leading to longer periods of exposure. Figure 1.3 indicates that the average number of years to certification with pneumoconiosis in white gold miners increased from 8 years in 1921 to 22 years in 1953 and 26 years by 1980. Data on years to certification for pneumoconiosis in black workers are only available after 1975, when there were 15 years to certification. This rose to 16 years by 1985 and the available data suggest that it has remained stable at 16 years . Corbett has shown that the prevalence of silicosis of greater than or equal to ILO grade 1/1 in in-service workers aged 30 to 39, is 5 per cent whilst over 40 years of age, it is 23 per cent.

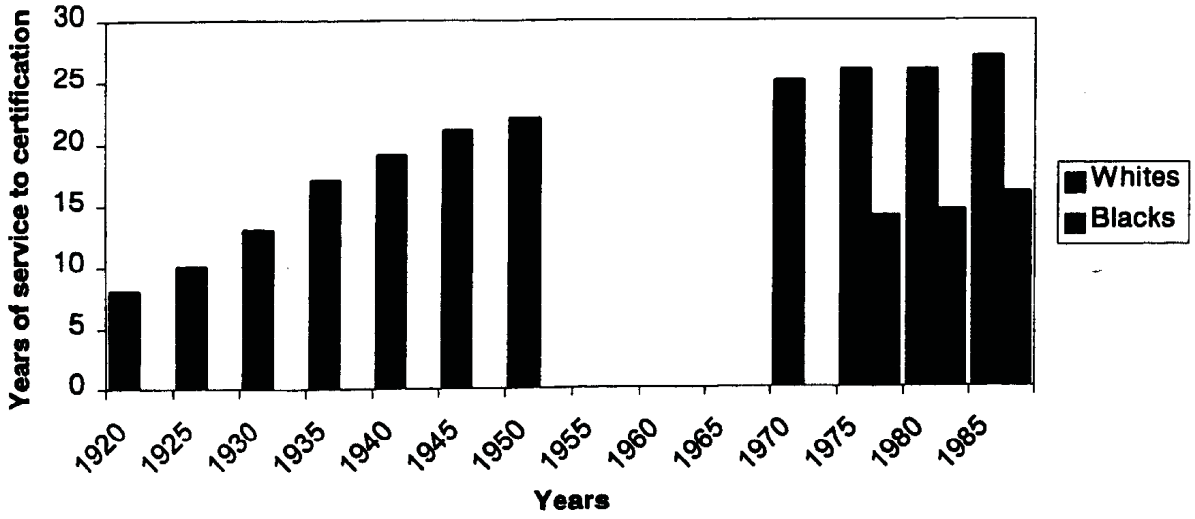


Figure 1.3 Average number of years of service prior to certification with pneumoconiosis

Source: Leger JP, 1995.

1.3.11 Indications for future occupational lung disease trends

Dust levels will be dealt with in detail in subsequent chapters but as has been stated above, the 1994 Commission of Inquiry into Mine Health and Safety reported that there was no evidence to suggest that dust levels have been reduced on South African gold mines during the past 50 years. Trends as regards dust levels determine the extent to which the health hazard is increasing or decreasing. White notes that dust control measures resulted in a significant reduction of respirable dust in South African gold mines in the early twentieth Century and that by 1940, mortality rates had declined markedly as a result of this reduction. However, Beadle stated in 1969 that there was no evidence for a reduction in underground dust levels on South African gold mines in the period since 1938.[76] Hnizdo comments that dust levels have dropped slightly since 1970 and attributes this to the establishment of a compensation fund into which each mine contributes a levy based on dust levels.[77] A retrospective study of autopsies carried out between 1975 and 1991 shows no statistically significant trend in the prevalence of silicosis due to factors other than increasing age and years of service, indicating that dust levels on South African gold mines remained unchanged during this period.[78]

Lewis and Jeebhay are of the opinion that modern mining practices have increased exposure to respirable dust in several ways.[79] First, the rapid increase in subcontracting of underground labour since 1987 has worsened working conditions and practices. Secondly, the increased

use of production-related bonus payment systems directly conflicts with health and safety objectives. Thirdly, the 1980s saw an increase in the average length of service for black mineworkers, resulting in longer exposure to respirable dust. Finally, the introduction of full-calendar operations has increased the annual hours worked by individual mineworkers, hence increasing their rate of exposure. The above dust data indicate that the incidence of occupational lung disease may increase with the increasing dust exposure associated with modern, mechanised, full-calendar mining methods that are not matched by improvements in mine ventilation and underground environmental control.

1.3.12 Changing status of labour sending areas

The relative importance of the various labour sending areas has changed over time. The resuscitation of the gold mining industry after the South African war (1899-1902) was bedevilled by severe labour shortages, so the colonial authorities were persuaded to allow the mines to employ indentured Chinese labour. This provided a temporary solution but was phased out by 1909 for reasons beyond the scope of this thesis. After the phasing out of indentured labour, renewed attention was given to recruitment locally, particularly from the Eastern Cape, Mozambique and Malawi. However, the high mortality rate of 'tropical' workers (defined as those who came from north of 22 degrees south latitude), mainly from pneumonia and tuberculosis, led to the exclusion of 'tropicals' and encouraged the use of domestic labour.[80] Between 1913 and 1930, there was a government-imposed ban on tropical labour. However, during the 1930s and 1940s, the gold mines began to lose South African workers to better paid jobs in other industries and by 1960, Malawi and Mozambique were supplying the bulk of mine labour. By 1972, only 25 per cent of black gold mineworkers (in a labour force of more than 350 000 workers) were from within South Africa. The rest were foreign (29 per cent from Lesotho, 21 per cent from Southern Mozambique and 24 per cent 'tropicals', mainly from Malawi). Three key factors resulted in a dramatic reversal of this recruitment pattern. First, the freeing of the gold price in 1973 initiated a period of expansion in the gold mining industry.[81] Secondly, in May 1974, after an aeroplane carrying Malawian mineworkers had crashed, Malawian president Hastings Banda abruptly withdrew all Malawian labour. Thirdly, the revolution in Mozambique resulted in a dramatic drop in recruitment (to only 6 per cent of the workforce) from that country.[82] The freeing of the gold price in 1973 facilitated a rise in real wages, which was explicitly directed at attracting domestic labour. Moodie argues that the total withdrawal of Malawian labour and the

reduction in the availability of Mozambican labour, resulted in a major alteration in the migrant labour system.[83] While foreign workers, with greater access to agricultural land and familial farming opportunities, had been willing or able to work in the mines for very low wages, the wage dependency of the majority of South African workers meant that they simply could not support their families on mineworkers' incomes. Average cash wages for black mineworkers were increased by 62 per cent in 1974 and again by 68 per cent in 1975. The shortfall in foreign workers was largely made up by South African workers from the Eastern Cape, specifically the eastern part of the Eastern Cape, namely the former Transkei. In the period 1977 to 1985 the number of workers from the former Transkei rose from 90 000 to 135 000.[84]

The downscaling and lay-offs of the period 1987-1995, resulted in the loss of 250 000 gold mining jobs.[85] Retrenchments have been particularly dramatic in relation to Transkeian workers. In the period 1986-1992, fifty percent of the migrants from the Transkei were retrenched, as opposed to only twenty percent from Lesotho. In the period 1984-1989, the Transkeian labour force dropped from 135 000 to 114 893. By 1997 this figure had fallen to 84 000, below the 1977 levels.[86] Phillip argues that dismissals have presented management with a powerful political tool and that lay-offs have been used to specifically target NUM activists.[87] Phillips argues that differential patterns of retrenchments can be attributed to a management perception that workers from the Transkei were particularly prominent as NUM activists. Davies and Head argue that from the mid-1980s, onwards the gold mines made a deliberate and substantial change in the demographic composition of the workforce in order to take advantage of the political and economic vulnerability of foreign workers.[88] This demographic change was accompanied by a significant reduction in real wages and a reversal of the gains made by the NUM in the early 1980s; annual wage settlements in the period 1990 to 1993 were well below the inflation rate.[89] The economic impact of these retrenchments on the Transkei has been considerable. While there are no direct data on the economic effects of retrenchments in the Transkei, a study which followed up men who were retrenched from Harmony gold mine and were repatriated to Lesotho reported that half the households surveyed no longer had a cash income of any kind.[90]

1.3.13 Occupational health consequences of the changing status of differing labour sending areas

The policy of recruiting from within South Africa from 1974 onwards, resulted in a greatly

increased proportion of the workforce coming from areas with a higher prevalence of latent tuberculosis.[91] Data from the MBOD annual reports back up the suggestion that internalisation of the labour force coincided with an increased incidence of tuberculosis on the mines. In 1974, MBOD data put the incidence of tuberculosis at 4/1000. By 1976, this had risen to 7/1000 and by 1985 the incidence was 10/1000. Data presented in Table 1.1 show that differences in latent infection rates may have played a role in the relative risk of mineworkers recruited from different areas. However, Packard feels that the differences between infection rates are not as large as the differences in incidence and that this suggests that other factors, such as better overall health in workers drawn from countries outside South Africa, may explain the sharp rise in tuberculosis incidence that accompanied the internalisation recruitment policies.

1.3.14 Underdevelopment caused by labour migrancy

As noted above, the industrialisation of South Africa was initiated by the mineral discoveries of the late 19th century and has depended on a widespread and persistent system of oscillating labour migration. The consequences of this form of industrialisation have been felt both in the labour receiving and the labour sending areas and there is much debate as to the effect that this has had on the South African economy. In a neo-classical analysis of the economic significance of the South African migrant labour system, Oberai and Singh argue that there are benefits to both labour sending and labour receiving communities: rural communities benefit because there is more money to be made at the mines than in employment at home, while urban industry benefits from the labour of the migrant workers.[92] Conversely, Wilson writes that one needs to look beyond the immediate, micro-level, benefits of wages and profits to the broader issues of capital accumulation and development.[93] While mining sparked industrial development and the growth of cities in urban areas, rural sending areas have become pit villages, dislocated urban communities, in which the community is dependent on mine wages, leading to erosion of the subsistence economy.[94] Out-migration has resulted in a shortage of labour at critical moments in the rural agricultural production process and has also created new consumption patterns involving the purchasing of industrially-produced goods.[95] Migrant mineworkers and their families contribute to the development of the urban economy both with their labour and with their purchasing power. Wolpe argues that the migrant labour system in South Africa has promoted uneven economic development which has promoted the strength of the core urban economy and has hindered development at the periphery.[96] Wolpe,

in his analysis of the South African migrant labour system, concludes that as a consequence of the migrant labour system, the costs of renewal of the labour force are borne largely by the communities from which the labour is drawn, thereby lowering the direct cost of labour to employers. In effect, the rural economy has subsidised the mining industry.

1.3.15 The health costs of underdevelopment and externalisation of occupational disease

Wilson describes the 'simultaneous production of wealth and poverty' and links this differential economic development pattern to deleterious demographic and health consequences in labour sending areas.[97] Wilson goes on to explain that a mining industry in a democratic South Africa needs to expand the concept of health and safety to include the notion of well being of workers and labour sending communities:

> "it seems to me that what we are looking at when we are looking at health and safety is the well-being of the human beings who are most intimately connected with the mining industry ... the workers and their families because the mining industry is central to the way in which this society has developed we are looking at the well being of the economic person in the new South Africa".[98]

Wilson's view is supported by the Reconstruction and Development Programme[99] and the National Health Plan for South Africa,[100] both of which identify the important contribution that occupational health must make to the development of a single, comprehensive, equitable and integrated national health system. In order to meet the needs of unemployed and retired workers and also those of the families of deceased mineworkers, comprehensive occupational health services within the framework of the Reconstruction and Development Programme and the National Health Plan are required in the mine labour sending areas.

Cohen points out that the social and health costs of labour migration are borne by the communities in labour reservoirs. It is Cohen's contention that rual households act to:

> "renew, repair and recuperate exhausted labourers. In the event of sickness, injury and disability they (the rural migrant households) become field hospitals. When workers are fired, marginalised or reach old age, the peasant household provides a functional substitute for unemployment benefits, redundancy payments and a pension." [101]

Many of the health hazards associated with mining represent costs of production that have not

been counted or billed to the mining industry. Repatriation of sick workers and the lack of follow-up for former employees, represent externalisation of health costs that will be dealt with extensively in this thesis and will, therefore, be only briefly touched on here.

1.4 Conclusion

It is very difficult to evaluate the historical trends in occupational lung disease in black mineworkers because so little information is available. This lack of information stems from discriminatory access to surveillance systems and a common failure to include health and safety in the overall assessment of mining. There is also very little occupational health data pertaining to labour sending areas and retired/ retrenched mineworkers. It is hoped that this thesis will fill some of the gaps pertaining to occupational lung disease, specifically pneumoconiosis, in black rural former mineworkers.

Despite the relative lack of data, it is clear that the cost structure and political economy of gold mining, notably with regard to migrant labour, job reservation and, recently, labour stabilisation, have had major impacts on occupational health. These effects have been felt in rural communities throughout South and Southern Africa through the externalisation of costs of disease. Evidence presented above suggests that modern mining methods may be putting workers at increased risk of developing occupational lung disease. Occupational disease represents a previously uncosted cost of production which will be examined in this thesis.

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CHAPTER 2

The Legislative Framework for Compensation for Occupational Disease in the Mining Industry

"Our experience of commissions has been that their recommendations are frequently shelved or ignored. For example, a careful comparison of the complaints made before the Native Grievance Enquiry of 1914 with present day conditions will reveal the startling fact that very little has changed."

Submission by the African Mineworkers Union to the 1943 Witwatersrand Gold Mines Native Wages Commission

2.1 Introduction

This study had two main objectives. The primary objective was to evaluate the prevalence of occupational lung disease in a random sample of ex-mineworkers using radiological examinations and spirometry, the results of which are discussed in chapter six. The secondary objective was to evaluate the extent of undiagnosed, uncompensated occupational lung disease in the study group and to help those eligible for compensation, to claim. This second objective was met by completing and submitting benefit examination reports and assisting with follow-up of applications. Compensation claims for occupational lung disease in mineworkers occur within the legal framework of the Occupational Diseases in Mines and Works Act, (ODMWA).[1] This chapter will provide a critique of the ODMWA, in which it will be argued that its underlying principles are conceptually flawed in ways that place mineworkers at a disadvantage relative to workers in other sectors of the economy. This chapter will also examine the historical contribution of the gold mining industry to the ODMWA Compensation Fund and assess the value of this contribution over time in real terms. Furthermore, the racial inequalities and the decline over time in the real terms value of compensation awards made under the ODMWA, will be assessed. In subsequent chapters, the implications of the conceptual weaknesses and inequalities within the ODMWA for the health of ex-mineworkers living in Libode, are described and analysed. Furthermore, the impact of the changes in the value of the contributions made to the ODMWA fund on its future viability are assessed.

There has been little legal commentary on occupational disease legislation, and that relating to mining is especially noteworthy for the lack of attention it has received. There are few commentaries on the evolution of mining disease legislation in South Africa but the little research that has been done on the interrelationships between the many acts, amendments, and commissions of inquiry relating to mining disease, is patchy. While Katz[2] provides an analysis of the period 1886-1910, and Donsky[3] covers the period 1910-1946, there are no published commentaries for the period after 1950. Here, only the ODMWA is considered in detail, since a lengthy study of other legislation is beyond the scope of this thesis.

2.2 Overview of the ODMWA

The first official recognition of the adverse effects of mining on the health of workers in South Africa, was the Miners' Phthisis Commission, 1902-1903. This was followed by regulations promulgated in 1905 which were designed to inhibit dust formation, and the subsequent 1907 Mining Regulations Commission, which investigated dust control. The Miners' Phthisis Act of 1911 introduced state-regulated, periodical examinations for mineworkers and compensation for workers suffering from what was then known as 'phthisis' and is now called silicosis. Compensation was initially only available to whites but subsequently for blacks, too, although at substantially lower rates.[4] This Miners' Phthisis Act was added to and amended over the next 62 years, leading to its current incarnation as the ODMWA (Act 78 of 1973, Amendment Act 208 of 1993). All citations below, unless otherwise stated, are to the amended act.

2.2.1 Principles upon which the ODMWA is based

The ODMWA is a compensation system for employees and ex-employees in which employees are entitled to compensation without having to prove negligence or fault on the employer's part. Under this system, the state mediates between employers and employees to administer a social security mechanism requiring compulsory contributions from employers. This system represents a state-brokered compromise between the competing interests of employers and employees. Until recently, it was assumed the right of a mineworker with an occupational disease to undertake a civil claim against the employer for damages was prohibited however a careful reading of the ODMWA shows that there is no explicit prohibition on such civil action.

The ODMWA provides for the payment of compensation for compensable diseases contracted

by people performing risk work at a controlled mine or works. In terms of chapter two, Section 13, (1):

> "the Minister may by notice in the Gazette declare to be risk work any particular work or all work performed in or at or in connection with any mine or works or part of a mine or works or at a particular place or under particular circumstances in or at or in connection with any mine or works".

In terms of Chapter 2, Section 13, (2):

> "the minister shall under subsection (1) declare any such work as is referred to in that subsection to be risk work if he is satisfied, after consultation with the risk committee and after consideration of such representations as may have been made to him by the owner of the mine or works in question or by any organisation acting on behalf of such owner or on the behalf of persons employed at that mine or works, that any person performing the work in question is exposed to dust of which the composition and concentration is potentially harmful or gases, vapours or chemical substances or factors or working conditions, which, in the opinion of the Minister are harmful or potentially harmful".

Chapter 2, Section 10, states that the Minister determines controlled mines and works as those where risk work is performed. Controlled mines and works are governed in terms of the ODMWA. There are approximately 450 controlled mines and 75 controlled works in South Africa (which make up the majority of companies in the mining industry).

Provision is made under the ODMWA for the level of risk in each controlled mine or works, to be assessed. This is overseen by the Risk Committee for Mines and Works. Risk is assessed (in terms of Chapter 2, Section 20) by means of periodic gavimetric dust sampling, which will be discussed in greater detail in chapter four. The concentration of specific airborne particles is determined and on the basis of this assessment, a levy is raised (in terms of Chapter 5, Section 62) from each employer. This levy enables the ODMWA Compensation Commissioner to pay compensation for every person who performs risk work at or in connection with that mine or works and who is found to have a compensable disease. The amount payable is prescribed in the Government Gazette.[5] The dust risk is translated into a levy by way of risk tables designed by an actuary according to principles that attempt to take

into account the current rates of compensation payment and the latent liability. As will be shown later in this chapter and in chapter 9, the latent liability of the ODMWA Compensation Fund is probably underestimated.

The diseases recognised as compensable are listed in the definitions section of the ODMWA as pneumoconiosis (silicosis, asbestosis coal workers pneumoconiosis), pneumoconiosis together with tuberculosis (tuberculosis contracted during service or within twelve months of last risk shift), permanent partial obstruction of airways, platinum sensitivity, progressive systemic sclerosis, asbestos related lung cancer or methothelioma and any other irreversible disease of the cardio-respiratory organs attributable to risk work.[i]

2.2.2 Institutions provided for under the ODMWA

The ODMWA is administered by the Department of Health. Three institutions within the Department of Health provide services required for the ODMWA compensation system: the Medical Bureau for Occupational Diseases (MBOD), the office of the Compensation Commissioner for Occupational Diseases and the Pathology Division of the National Centre for Occupational Health (NCOH).

The Medical Bureau for Occupational Disease (MBOD) is established under Chapter 1, Section 2 of the Act:

> "for the performance, under the supervision and control of the director, of such functions as may be necessary for the provision of giving effect to the provisions of this Act and such other functions as may from time to time be assigned to it by the Minister ".

Chapter 3, Section 32 (1) states that:

> "any person who works or has worked at a mine or works, or any other person acting on behalf of such a person may at any time apply to the Director for a medical examination of such a person for

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[i] Katz argues that a key precedent which was set in 1916, and which is still recognised in the current legislation, is that compensation should be paid in cases where dust is thought to play a role in the disease, even if there are also other contributory factors. This was established initially in relation to the compensation of tuberculosis, but is the precedent that allows for the 1973 classification of COLD as a scheduled, compensable condition, despite a range of non-mining risk factors, because it was felt that inhalation of mine dust over time was a contributory factor.

the purpose of determining whether such a person is suffering from a compensable disease, or if he has previously been found to be suffering from such a disease, the degree of such disease".

Under Chapter 3, Section 32 (1) (a), the Director is obliged to 'cause such a person to be medically examined as soon as possible', also under Chapter 3, Section 32 (1) (b), to 'submit to the Certification Committee a detailed report on the condition of the health of that person' and under Chapter 3, Section 32 (1) (c), to 'cause such further examinations, tests and observations to be carried out as the Director may deem necessary or as the certification committee may require'. There is provision within this section for the Director to delegate this task to medical practitioners outside the MBOD. Chapter 3, Section 32 (3), entitles ex-mineworkers to a bi-annual benefit examination and to transport costs on an annual basis. Costs of the medical examination and transport are paid regardless of findings.[ii] A Medical Certification Committee is established under Chapter 4, Section 39, which is composed of not fewer than five medical practitioners (appointed by the Minister, of which one has been nominated by the employer bodies and one of whom has been nominated by worker bodies), with the Director as ex-officio Chair. The role of the Certification Committee is to determine if any person is suffering from a compensable disease. Chapter 4, Section 46, empowers the Certification Committee to determine if a person was suffering from a compensable disease at the time of death. A review committee is established under Chapter 4, Section 46 established for the purpose of appeal. The financial liability for the cost of running the MBOD (including transport and medical examination costs which are not included in the levy) falls to the Department of Health. Chapter 1, Section 8, specifies that annual reports must be compiled by the Director of the MBOD, detailing the activities of the MBOD, the Certification Committee and the reviewing authority. Section 77, (1) states that the Compensation Commissioner is also required to produce an annual report.

The ODMWA also makes provision for regular medical examination of exposed employees at the MBOD and entrusts the director of the MBOD with the granting of certificates of fitness (known as a "red ticket"), without which a mineworker may not perform risk work. However, the functions of periodic medicals and the issuing of red tickets have now been superseded in terms of the Mine Health and Safety Act, Act 29, 1996, (MHSA). The MHSA will be

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[ii] Unlike the Compensation for Occupational Injuries and Diseases Act (COIDA) section 73 in which the individual is liable in the event of no occupational disease or injury being diagnosed.