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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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discussed in more detail in chapter four.

As mentioned above, the ODMWA provides for the creation of a Compensation Fund to pay workers from controlled mines and works who have scheduled diseases. The administration of this fund is the responsibility of the ODMWA Compensation Commissioner. In addition to overseeing the payment of benefits, the ODMWA Compensation Commissioner is also responsible for raising levies from controlled mines and works each year in order to meet the expected benefits payments from the Compensation Fund.

2.2.3 ODMWA compensation payment principles

The ODMWA Amendment Act of 1993 transformed a race-based compensation system into a wage-based compensation system. The improved benefits introduced in April 1994, apply retrospectively and are available to ex-mineworkers found, after 1994, to have a compensable occupational lung disease. Chapter 4, Section 44 (1), defines disability due to compensable disease in two degrees of severity for the purpose of the definition of permanent disability. 'First degree' covers those suffering from one of the scheduled diseases resulting in a permanent disability of more than 10 per cent but less than 40 per cent. 'Second degree' covers those suffering from more than one compensable disease simultaneously; or a single disease producing permanent disability of greater than 40 per cent; or simultaneous occurrence of tuberculosis and another compensable condition.[iii] Temporary benefits for workers receiving treatment for tuberculosis are also provided for. Chapter 5, Section 48 (1), specifies that notification of the finding of the Certification Committee is to be sent to the patient within ten days.[6] Chapter 3, Section 36 (A), states that the owner of a controlled mine or works is liable to pay medical costs incurred, in the course of such disease for up to two years from the date of commencement thereof. If further medical treatment will reduce the burden of the disease, the commissioner may pay expenses or direct the owner of the mine or works to do so.

Chapter 6, Section 80, (A), states that compensation is payable as a single lump sum benefit calculated in accordance with the formula (A x 12) x B, where A is earnings up to R2000 per

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[iii] Note that this division stems from an early precedent which allows for the assessment of compensation awards according to degree of disablement. Since 1912 compensation awards for white and coloured mineworkers have been based on the principle of first and second degree disablement, where first degree is 20-50 per cent disablement and second degree is 50 per cent and above disablement.

month, B for first degree severity is 1.31 and for second degree disablement is 2.917 (or if previously certified, first degree 1.607) with a minimum first degree payment of R7000. Tuberculosis that does not cause permanent disability but which is contracted in service, results in a payment of 75 per cent of loss of earnings for up to six months. Chapter 6, Section 80, (A), includes payment in kind of food, accommodation and overtime remuneration within the ambit of wages. There is no such payment for former mineworkers. Where there is a latent period between the last job worked and the diagnosis of disease, current earnings in the last job are treated as wages for the purposes of the compensation calculation.

Until mid-1998, there were no statutory regulations governing the work of the Certification Committee. Specific regulations were published for comment in July 1998.[7] After the publication of the proposed regulations in July 1998 numerous comments were received and the 'regulations' were never republished in any amended form. Consequently the proposed regulations have no legal standing. All cases reported on in this study were finalised prior to the proposal of these regulation, which are intended to standardise decisions of the MBOD Certification Committee and assist sending doctors to assess the probability of eligibility for certification. The proposed regulations state that first degree silicosis can be certified as such if there is ILO profusion category ≥ 1/1 plus moderate restrictive or obstructive lung function abnormality (i.e. FEV_1 or FVC 65-52 per cent of predicted value or FEV_1/ FVC ratio < 65). In the absence of pulmonary function tests, first degree silicosis is certified as such if the chest radiograph is read as ≥ 2/2. Second degree silicosis is classified as ≥ 1/1 plus severe lung function abnormality (i.e. FEV_1 or FVC < 51 per cent of predicted value or FEV_1/ FVC ratio < 55). According to ODMWA, silicosis with tuberculosis should also be classified as second degree disablement. In order to be certified by the MBOD as, having COAD a mineworker must have undertaken risk work less than ten years previously and have FEV_1/ FVC ratio < 65 per cent. In the case of a former mineworker being outside the ten-year threshold, evidence of impaired lung function at the time of last mine service, is required.

2.2.4 ODMWA research levy

In terms of Chapter 8, Section 120(2), of the ODMWA the Minister may:

> "subsidise or pay wholly or partly the costs of maintenance and other expenses of any institution or organisation having as its object the doing of research with a view to the protection of the health of persons employed in or at or in connection with mines or works or the prevention or alleviation

of diseases to which such persons are exposed".

The Research Account established under Chapter 5, Section 63 (1), is funded by way of a dust levy. This section states that:

> "The owner of a controlled mine or a controlled works shall pay to the commissioner for the benefit of the compensation fund, in respect of each shift worked by a person at or in connection with the mine or works in question during which such person performed risk work, such amount for purposes of research contemplated in section 120 as the Minister may determine".

The Epidemiology Research Unit, which is funded under Chapter 5, Section 63 (1), of the Act, was responsible for supporting the present study.

2.2.5 Resources to implement the ODMWA compensation system

The 1996/1997 budget of the MBOD is roughly R7 million for medical costs (medical salaries and costs of medical equipment) plus a further amount covering administration costs, which are included in the administration budget of the Chief Directorate for Occupational Health (NCOH and the MBOD). This amount is approximately R5.5 million. The total budget for the Chief Directorate for Occupational Health is R24 million, representing 7.9 per cent of the total national Department of Health budget, (i.e. excluding the nine provincial departments of health).[8] The remaining R11.5 million is spent on occupational health in the non-mining sector of the economy. The MBOD has 40 administrative and support staff and 37 medical staff based in Johannesburg and 7 administrative and support staff and 9 medical staff based at the sub-bureaux at Rustenburg, Welkom and Witbank.[iv] The Compensation Commission is funded directly by the Department of Health. It has an annual budget of R18 million (of which R13 million is used to pay out the 1956 Pension Fund and is not related to its compensation function)[9]. Approximately two of the remaining R5 million is used to pay compensation to mineworkers who worked on non-controlled mines and mines that closed before October 1973. Hence, the administration budget of the ODMWA Compensation Commission amounts to roughly R3 million. The Compensation Commission has a staff allocation of 36 people, but only 22 of the posts are currently filled. In 1996-97, R38 million was raised from

[iv] A review of MBOD staffing is currently under way and this may change somewhat as a result of the review.

gold mines to pay compensation under the ODMWA. This R38 million is over and above the amounts discussed previously.

2.3 Compensation

A discussion of international compensation models is beyond the scope of this thesis. The ODMWA is unusual in employing a lump sum payment, in as much as most compensation systems internationally make use of pensions. While the ODMWA is unusual, it is not unique. Within South African compensation legislation the act that caters for industry other than mining provides a lump sum payment for diseases causing imparment of 30% or less. Sweden also provides a lump sum payment, that under certain conditions, may be the only payment to the claimant.[10] Historical reasons may explain the form of compensation payment for the mining industry. White mineworker organisations played a role in the drafting of the original legislation. White mineworkers have traditionally had work pension schemes and occupational dust exposure levels which make for detectable disease only at retirement or on autopsy at death, both being times when lump sum payments are advantageous to people, or their families, with existing pensions.

2.4 Flaws within the ODMWA

South African occupational health legislation has followed two parallel paths: that relating to mining and that relating to industries other than mining. This division is manifested in current legislation as two statutes: the Compensation for Occupational Injuries and Diseases Act (COIDA) Act 130, 1993 and the ODMWA.[v] As mining created the context for the country's first industrial relations legislation, so, too, did it gave rise to the first legislated occupational health provision. Budfender writes that a combination of the inherent dangers of mining, the importance of mining to the South African economy, the unique organisation of employer bodies, the need to maintain a fit, productive work force in extremely harsh and dangerous conditions and the political power of organised white labour, were the key factors which led to promulgation of first piece of occupational health legislation in South Africa.

Mining disease surveillance and compensation, commencing with the Miners' Phthisis Act of 1911, has been shaped by a legal and political framework that has remained substantially

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[v] Section 100 of ODMWA provides that no person is entitled to benefits under the ODMWA for any disease for which he/she is receiving benefits under COIDA and vice versa.

unchanged for eight decades, leading Lewis and Jeebhay to comment that the history of mining occupational health in South Africa has been essentially conservative and racist.[11] The ODMWA Amendment Act of 1993 (implemented on 1 March 1994) began the move away from this outdated framework. The Mines Health and Safety Act, Act 29 of 1996 (MHSA) ushered in a new era of non-racial, tripartite, transparent regulations.[v][12] However, the legacy and the substantial vestiges of this legal framework still remain in an under-developed occupational health service characterised by failure to provide early detection and treatment of disease and failure of the compensation system to reach eligible workers.

The 1993 ODMWA Amendment Act removed all explicit references to race but has failed to deal with past deficiencies. This acts to disadvantage the black former mineworkers relative to their white colleagues as well as all mineworkers with occupational lung disease relative to workers in other sectors of the economy. Furthermore, as has been shown above, inflation has significantly eroded the value of compensation payments since 1973.

2.4.1 Residual racial inequality

Myers and Macun argue that racism has provided the ideological basis of 20th Century South African society and that it has also determined, in many ways, the development of its occupational health systems. Until the formation and employer recognition of the National Union of Mineworkers (NUM) in the early 1980s, occupational health legislation in South Africa was formulated largely in response to the struggles of unionised white labour organised along lines of race and skill. This acted to exclude black workers and marginalise their health, safety and compensation needs. A politically powerful, organised, white labour movement succeeded in gaining disease prevention and compensation legislation for white workers that was far in advance of systems prevailing in Europe and North America in the 1930s. A key consequence of this racial paradigm was that until 1993, compensation payments and occupational health service provisions were determined by race in ways that severely disadvantaged black workers.

While formal racial discrimination was removed from the workers' compensation legislation pertaining to the non-mining sector of the economy in 1973, it remained a feature of the ODMWA until the time of the 1993 amendments. The aim of the 1993 ODMWA Amendment

Act was to remove racial differentiation in compensation and service provision. While explicit references to race were removed, the new Act does not address the legacy of occupational disease among black former mineworkers nor indeed, the limitations in the old Act which effectively prevented black former mineworkers from receiving occupational health surveillance, treatment or compensation at the same level as white former mineworkers. In practice, under the amended legislation, black mineworkers remain significantly worse off, relative to their white colleagues. Hence it is my contention that residual discrimination persists within the ODMWA as the amendments were framed within the same theoretical paradigm from which the original Act arose. Abdullah *et al.* argue that the amendments were motivated primarily by the need to remove the last racist legislation on the statute books rather than to address and deal with the problems inherent in the ODMWA and that as a result, the ODMWA is still a very conservative system for all mineworkers.[13] While the ODMWA pronounces all mineworkers to be formally equal in law, it is flawed in the following respects. First, the amendments do not provide for making amends for past failings of the system. Secondly, the amendments transferred a payment system based on racial categories into a system based on earnings. Occupations, skills levels and wages in the mining industry are themselves based on historically racially discriminatory practices. Therefore, racial barriers have been subsumed into seemingly racially neutral job categories. Thirdly, the ammendments did not achieve equity with compensation standards set out in COIDA, as will be elaborated upon in the section that follows, on compensation. On the preceding grounds, it may be argued that the ODMWA is discriminatory and in breech of Chapter two of the Bill of Rights, Section 9, subsection 3 of the Constitution of the Republic of South Africa, 1996 which states that " everyone is equal before the law and has the right to equal protection and benefit of the law."[14]

2.4.2 Health service provision

In 1916, compulsory annual X-rays and medical examinations were introduced for white workers and formed the basis of a state occupational disease surveillance system. Black workers were excluded from state occupational disease surveillance systems at the MBOD (and its predecessors) and instead had to rely on mine doctors paid by mining companies for their occupational health surveillance. Such doctors forwarded medical reports to the MBOD for certification. Financial responsibility for occupational health facilities for black workers rested on mine owners. Prior to the 1993 Amendment Act, black ex-mineworkers did not have

access to the MBOD medical facilities. These facilities are now available to all workers but the amended Act fails to provide any guidelines or regulations to guarantee service provision. The existing state-funded, dedicated facilities for mineworkers' medical benefit examinations are situated in mining towns where black workers have resided only whilst in mine employment. Ironically, now that some mineworkers are moving to such towns permanently, ODMWA medical benefit facilities are being closed to cut costs. Although it is theoretically possible to arrange, via the director of the MBOD, for a benefit examination to be undertaken in the home area, it is extremely difficult, in practice, given the lack of awareness by mineworkers and health workers as to their rights and obligations under the ODMWA. Furthermore, the capacity of medical facilities and personnel in labour sending areas to undertake benefit examinations on a large scale, without additional resources, is extremely limited and the ODMWA is rendered ineffective by a *de facto* lack of service provision. Jeebhay argues that the only advantage for mineworkers that the ODMWA has over compensation legislation pertaining to non-mining sectors of the economy, is that mineworkers are entitled to lifelong, free, benefit examinations.[15] This, however, means nothing for the majority of workers, who have no access to such services.

The inherent flaws in the Act become apparent if one considers two of the critical factors affecting black former mineworkers: the migrant labour system and the natural latent period of many occupational lung diseases. Because the latent period may be several decades, the occupational lung disease of former mineworkers may only manifest in the areas to which they return, i.e. long after leaving mine employment rather than while they are still on the mine itself. Although the ODMWA purports to deal with ex-mineworkers and acknowledges latency, it fails to acknowledge migrancy as a complicating factor. The current legislation is inadequate for dealing with the realities of the migrant labour system and the law does not provide for efficient detection of disease and equitable access to benefit examinations and compensation.

It should be noted that the ODMWA has one other benefit not recognized by Jeebhay. Compensation is paid for occupational disease present at death, even if the disease did not contribute to the death (the COIDA stipulation), moreover a system exists to provide post mortem examination to detect compensible diseases. Finally, it can be argued COIDA is only superior to the ODMWA with regard to compensation if workers can access benefits under the former. Viewed pragmatically it is possible that the COIDA provisions would be

unworkable for rural former mineworkers who would be required to bare the costs of examinations themselves.

2.4.3 Discrimination against mineworkers - flaws in ODMWA relative to COIDA

The ODMWA fails to pay adequate compensation relative to that provided by the non-mining sector as it is wage-based, and mineworkers' wages are low compared to those in the industrial sector. The provision for treatment of disease within the ODMWA is also inferior to that provided by COIDA. Kahn cites the example of a driller earning R1200 per month. At second degree compensation, this man would receive R42,000 under ODMWA, whereas under COIDA he would be classified as 100 per cent disabled and would receive a pension of R900 per month, which over ten years would amount to R108,000. [16,vii] This inequality is compounded by the inflation increases built into the COIDA pension. It can be argued that in a low-wage economy, lump sums may be better than pensions as they allow beneficiaries to undertake substantial projects (such as starting businesses). However, in order for this argument to be valid, benefits under COIDA and the ODMWA would have to be equivalent. As the ODMWA currently stands, it could be challenged in the Constitutional Court on the grounds that it discriminates against mineworkers relative to workers employed in other sectors of the economy. The one possible exception to the financial advantage of COIDA over the ODMWA could be early silicosis and Tb with mild impairment of lung function. Under the ODMWA the patient would be compensated as second degree, however, under COIDA the patient could be assessed as less that or equal to 40%.

The ODMWA is also unsatisfactory relative to COIDA in that COIDA defines four degrees of disability (20 per cent, 40 per cent, 70 per cent, and 100 per cent), while ODMWA has only two degrees (11-40 per cent and >40 per cent). Abdullah *et al* argue that this two-degree system fails to differentiate between the moderately and severely disabled. They also note that there is no provision, within the ODMWA, for those workers with a 0-10 per cent disability. In the Memorandum on the Objects of the ODMWA Amendment Act, it is argued that "an impairment of not more than 10 per cent is so insignificant that it does not warrant compensation",[17] but that there is evidence that up to 30 per cent deficit in FEV_1 may be

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[vii] Kahn's example is an extreme case a rating of 100 per cent disability, which is usually reserved for those who die from a disease.

included in this 0-10 per cent disability group on the basis of radiological or pathological evidence. An impairment of less than 10 per cent can be significant in certain socio-economic contexts but not in others. Arkles has argued that in a context of low levels of education and high levels of dependency on the ability to perform physical labour in order to be employed, even a relatively minor degree of impairment can be a major obstacle to obtaining future employment.[18] Any impediment to employment seriously disadvantages individuals and jeopardises household viability. This topic is discussed further in chapters three and nine. Failure to acknowledge the difference between moderate and severe disability and failure to recognise the socio-economic context as it affects the extent of disability, are inadequacies within the ODMWA. Wage-based compensation provides the lowest amount of compensation to those least likely to work again. Bachman emphasises the fact that the inadequacy of occupational lung disease compensation in South Africa is compounded by the fact that there are very few other forms of social security available; and that those that do exist (disability grants, pensions and unemployment insurance) are either inadequate or inaccessible.[19]

Hermanus writes that the ODMWA has a major conceptual weakness in that compensation is perceived as primarily monetary in nature and that it bases the monetary value of compensation on medical determination of impairment while 'in practice for most workers this award is not only compensation for impairment but also for long-term loss of earnings'.[20]

Hermanus notes that the relationship between compensation and long-term loss of earnings is recognised within the Labour Relations Act which allows employers to dismiss workers on the grounds of incapacity. Thus while the Labour Relations Act, implies that incapacitated workers are the responsibility of the compensation system, the compensation system fails to recognise the role of incapacitation in loss of earnings. Hermanus argues that compensation legislation:

> "needs to acknowledge what is currently happening to handicapped workers. It needs to recognise that most injured or ill workers lose their jobs i.e. the means to earn their living and furthermore, that the employment prospects of disabled workers are virtually nil partly because of discrimination against handicapped people and partly as a result of the high degree of unemployment (among able-bodied persons) in South Africa."

Hermanus argues for a 'fair and just' compensation system which recognises that loss resulting from occupational disease and injury is not only monetary in nature. She feels that

the compensation system should be expanded to include a broad concept of rehabilitation; determination of loss of long-term earnings; extrapolation in regard to what might be the additional costs of disease and calculation of the expenses involved in delegation of tasks previously undertaken by the incapacitated worker. COIDA (section 4,2), makes provision to subsidise the rehabilitation of and where necessary, to re-train incapacitated workers. ODMWA, on the other hand, makes no provision for re-training of disabled workers and hence no attempt is made to deal with the long-term effects of disease and loss of skills as far as the individual, his family, the community and, ultimately, the state are concerned.

2.4.4 Special concessions to the mining industry within the ODMWA

White draws attention to the fact that, special concessions were made to the mining industry regarding occupational disease relative to other sectors of the economy.[21] A key concession is that although operating mines pay levies into the ODMWA, they have never been responsible for the costs of medical examinations. The operating costs of the MBOD (R10.1 million in 1993/1994) are borne by the Department of Health. Such an arrangement exists only for the mining industry. Another key concession to the mining industry is reflected by the representation of the Chamber of Mines on the ODMWA Risk Committee. The role of the Risk Committee is to ensure that the levy of any mine covered by the ODMWA relates to the dust exposure of its workers. White argues that:

> "although the NUM has now been granted a seat on this committee, it seems moribund and levies have remained at the same level for many years."

White writes that Chamber of Mines representation on the Risk Committee has acted to monitor and minimise the industry's contributions to the ODMWA Compensation Fund. White argues that:

> "although minimising the compensation levy could make a modest contribution to lower production costs for individual mines, keeping compensation cheap could result in huge savings to the industry elsewhere. Ventilating deep level gold mines adequately to prevent dust disease is very expensive, such that this factor alone could possibly render some currently operating gold mines uneconomic. The recent Commission of Enquiry into Safety and Health in mining found that there was no evidence of a significant reduction in dust levels in gold mines in the last 50

years."

It can be argued that under-reporting of occupational disease and occupational hazard relating to mining, has played a key role in determining attitudes to occupational disease and its relative importance within the health services.

The 1981 Nieuwenhuizen Commission of Enquiry into occupational disease (appointed by the Minister for Health in response to the labour turbulence of the 1970s) recommended an end to racial discrimination within the ODMWA and a uniform compensation system for all occupational diseases for all industries. The Nieuwenhuizen Commission recommended ending the special dispensation for the mining industry. [22,23] While the White Paper resulting from this commission was accepted by Cabinet in 1982, no action followed until the ODMWA was deracialised in 1993.[24, viii] The ultimate deracialisation can be attributed to the rise of a powerful mineworkers' union representing black workers and a change in the overall power relationships in the country. The time taken from the Nieuwenhuizen recommendations to the ultimate deracialisation, indicates the power of the political forces opposing such a move. These same political forces, combined with territorial disputes between the Departments of Labour and Health, have obstructed the discussions regarding amalgamation of the legislation for all industries into a single Act. Abdullah *et al.* notes that there is no plan within the amendments for the integration of the ODMWA into the COIDA, despite the fact that no health reasons exist for a special dispensation for mining. He goes on to argue that this special dispensation places mineworkers at a disadvantage relative to those working in other sectors of the economy. Despite the many reasons for amalgamating the two schemes, it must be noted that switching to compensating mineworkers under COIDA would be very expensive given the much larger payments made under COIDA. There would have to be an increase in the levy, which the mining industry is likely to oppose. The reserve has been historically centred around lump sum payments and may not able to support a new benefit paradigm.

In considering the limitations of the ODMWA relative to COIDA, one should not lose sight of the one key advantage of the ODMWA, namely, the right to lifelong, free, benefit examinations. Care would need to be taken, in any attempted amalgamations so as not to deprive ex-mineworkers of this right which is essential for diseases with a long latent period.

[viii] There were 11 amendments to the ODMWA in the period 1973-1993, all related to an increase in benefits.

2.5 Making amends for past inadequacies within the ODMWA

There is a legacy of practices that discriminate against black mineworkers and the current ODMWA is inadequate to overcome this legacy. While there are plans to develop occupational health units at provincial level, budget constraints within the Department of Health make it unlikely that sufficient additional resources will be provided to ensure adequate occupational health surveillance for labour sending areas. White states that employers in the mining industry have:

> "a large debt to public health and to former miners with compensable disease. This debt can be partly repaid by making the funding available to the Department of Health to aid in the establishment of its envisaged system of occupational health units with the capacity to examine substantial numbers of former miners."[25]

White notes that such a reparation mechanism is not without precedent; the occupational health services in New York and Massachusetts are funded by way of a dedicated proportion of the workmen's compensation fund. Legislative changes to the ODMWA could be undertaken in order to allow for the industry-funded ODMWA Compensation Fund to cover costs of mining-related medical surveillance in labour sending areas. In this way, adequate occupational health coverage could be achieved.

2.6 Failures of the workers' compensation system internationally

While the above section criticises the ODMWA for its failure to turn *de jure* rights into *de facto* medical surveillance and compensation for ex-mineworkers, it must be noted that a number of international studies have shown a lack of worker access to and awareness of occupational health and compensation facilities. This lack of awareness is not related to a low incidence and prevalence of occupational disease. Several international studies have shown that a substantial proportion of workers suffer from disease that is work-related. A National Institute of Occupational Safety and Health (NIOSH) study carried out on a stratified sample of workplaces in Washington State found that 28 per cent of shop-floor workers had diseases that could be classified as occupational.[26] An Australian survey of male hospital admissions, found an excess attributable to occupation of 25 per cent.[27] These studies show that despite work-related disease being common, the goal of providing occupational health services that

are accessible to all,[28] is still far from being realised. Internationally, there is substantial evidence that the majority of workers who develop chronic occupational diseases with long latency periods, do not apply for workers' compensation.[29,30] Much of the failure to claim compensation can be attributed to a lack of awareness of and accessibility to the relevant legislation. It has been shown[31] that this problem is exacerbated in retired or retrenched employees, because the primary source of information about work hazards and compensation services is the workplace. A recent study undertaken by the Sheffield Occupational Health Project in England, found that the majority of workers with previously undiagnosed and uncompensated occupational disease had never received advice on compensation. This lack of awareness was found to be especially high in workers from ethnic minorities (who were often employed in the more dangerous jobs in the Sheffield steel industry from the mid-1950s until the recession of the early 1980s), many of whom had occupational lung diseases, occupational deafness and serious injuries which had gone uncompensated. The Sheffield Occupational Health Project has pioneered community-based, occupational health surveillance systems located in primary care facilities, using retired steel workers to take occupational histories and to provide much-needed awareness of the provisions of British workers' compensation legislation. Support groups of workers with specific needs have been established and translation of information into languages of relevance to high-risk groups of workers, has been undertaken. Later in this thesis, the community-based occupational health services that developed in response to the results of this study, will be described and evaluated.

2.7 Conclusion

The legal framework outlined above, has a long history. Many of the key components of this legislation are the product of precedents dating from the early 20th Century. The current ODMWA is inferior to legislation provided for other sectors of the economy in that it accords only two levels of disability and does not allow for compensation to be paid to workers with a disability deemed to be less than 10 per cent. Furthermore, the ODMWA does not deal with rehabilitation and provides for lump sum payments rather than pensions. It will be shown in a subsequent chapter that not only was there a racial bias in the collection of the dust levy but also that the real-terms value of the levy and compensation awards fell markedly for all races between 1973 and 1992. It has been noted that the only advantage that the ODMWA has over COIDA, is that workers are entitled to lifelong medical benefit examinations. However, this legislation is logistically inadequate to cope with the geographic separation between mine and

home areas which is inherent in the migrant labour system. In addition, the latency period inherent in various occupational lung diseases disadvantages black ex-mineworkers resident in rural areas because current legislation fails to adequately take account of the implications of the latency period. Examination of international workers' compensation paradigms reveals two key advantages that the majority of compensation systems have over the ODMWA. First, the recognition of the need for rehabilitation and training and secondly, the acknowledgement of the distinction between economic and non-economic loss and the provision to address both. The ODMWA Amendment Act (1993) was aimed at removing the last explicitly racist legislation from the South African statute books, the core paradigm remains largely unchanged. Consequently, the ODMWA is ineffective in providing for medical surveillance and compensation for the majority of mineworkers and ex-mineworkers. The consequences of this failure will be illustrated in subsequent chapters.

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CHAPTER 3

Trend Analysis of the Contributions to and Awards Made under the ODMWA Compensation Fund

3.1 Introduction

The amount collected and the size of awards granted through a system such as the ODMWA, is affected by price changes in the economy. Thus a trend analysis to examine the real value of payments made to mineworkers over time has been undertaken. In a system like the ODMWA, where awards were granted in a racially discriminatory way, the differences in payments by race are suggestive of changes in the relative power of racial groups to satisfy their demands for compensation.

3.2 Historical contributions of the gold mining industry to the ODMWA compensation fund and their value in real terms

In order to determine the way in which the real value of the ODMWA compensation dust levy has varied over time in terms of the legislated contribution per risk shift, data provided by the Compensation Commissioner for Occupational Diseases for a number of years between 1973 and 1998, was analysed. Figure 3.1 shows the amount payable per risk shift for gold mines, assuming a risk rating of one, in real 1995 rands using the Consumer Price Index to deflate prices.

Figure 3.1 not only demonstrates clearly the racially-biased nature of the dust levy collection system until 1992, but also the shows the extent to which the real value of the dust levy fell for all races between 1973 and 1992. There was a substantial increase in the rate of the dust levy in 1996 but in 1998, its real value fell back to just above the 1973 level for white workers. It is worth noting that there has been a significant reduction in the gold mining workforce in recent years and, consequently, a reduction in the number of risk shifts worked. This reduction will reduce the income of the ODMWA Compensation Fund even further. Since 1987, the number of gold mineworkers has fallen by about 30 per cent. Therefore, the total amount of money paid into the fund will also have fallen by this amount.

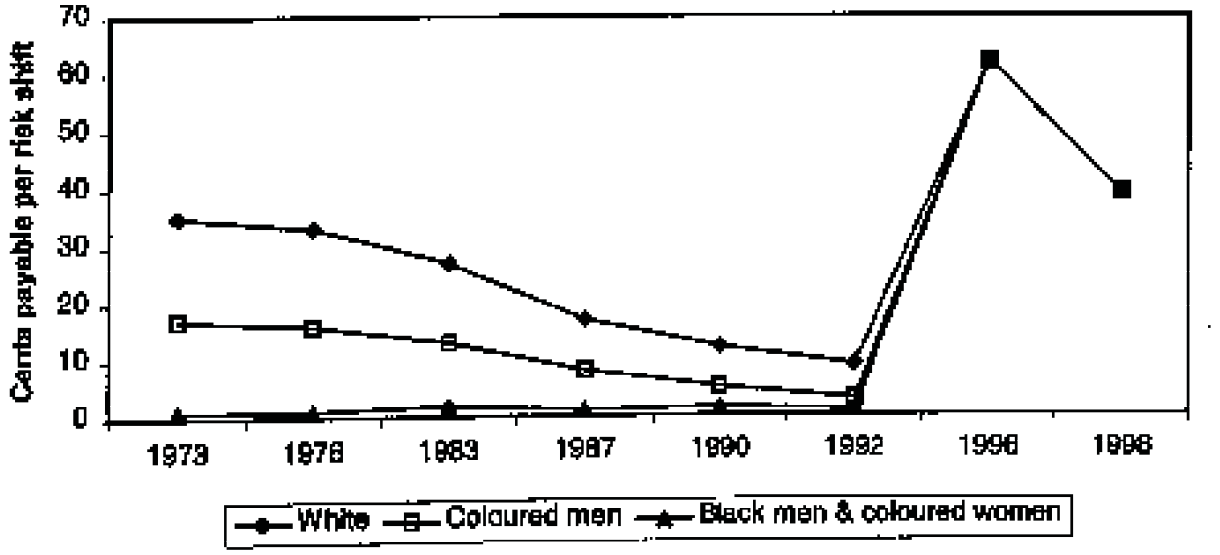


Figure 3.1 Cents payable per risk shift with a risk rating of one (in 1995 Rands)

Source: ODMWA Compensation Commission Annual Reports

In chapter nine, data on the prevalence of occupational lung disease in former mineworkers in the Libode district will be used to estimate the approximate liability of the ODMWA Compensation Fund (in terms of future drawdown on the fund by former mineworkers with uncompensated occupational lung disease and also in terms of projections of future disease in the current workforce). The implications thereof for the viability of the ODMWA Compensation Fund and the economic viability of the gold mining industry, will be discussed.

The ODMWA Research Levy has also been reduced substantially over the past twenty years. In 1979, it was set at 1c per white mineworker and 0.5c per black mineworker. Assuming that 90 per cent of the workforce was black, this corresponds to an average levy of 0.55c per mineworker. In September 1984, the levy was reduced to 0.15c per mineworker. Based on the Consumer Price Index, the value of the Rand had fallen by a factor of 7.6 between 1979 and 1995. In 1995, the levy was increased to 0.5c per shift. There has been no increase in the levy since then. The current value of the levy in real terms at 0.5c per shift is, therefore, 13 percent of what it was when payment of the research levy was started in 1979.

3.2.1 Racial inequality and the decline in the real value of ODMWA compensation awards

Racially discriminatory compensation payments were abolished under the 1993 Amendment

Act. Although black workers consistently made up the bulk of the disease certifications, they had, until then, only received a very small percentage of total payments. Prior to the amendments being made, compensation payments and the structure of compensation certifications were based on race. White and coloured workers were compensated in terms of a system which recognised occupational disease as being either first degree disablement or second degree disability. Pneumoconiosis plus tuberculosis was automatically treated as a second degree problem. Black workers were certified into a system which classified workers as having compensable disease or compensable disease plus tuberculosis. Both the categories for which black workers were eligible for are now considered to fall within the first degree category. Compensation payments made to black workers prior to the amendments were lower than those for white and coloured workers designated as having first degree disease. The data in Table 3.1 pertain to compensation awards for 1973, 1980 and 1991 (the payment rates determined in the 1991 amendments remained in place until the major de-racialising amendments of 1993). They illustrate the racially discriminatory nature of the payments. Nominal values that have been deflated by the consumer price index to a 1995 base year to show changes in the real value of compensation payments over time, are shown in table 3.2.

Table 3.1 Nominal value of compensation payments under the ODMWA by racial and disease categories (rands)

Year	Disease	White	Coloured	Black
1973	Tuberculosis	5000	2500	600
	1st degree	12000	6000	1000
	2nd degree	18000	9000	
	Compensable disease plus Tb			1200
1980	Tuberculosis	6655	3328	799
	1st degree	15972	7986	1331
	2nd degree	23958	11979	
	Compensable disease plus Tb			1598
1990	Tuberculosis	11574	6544	2096
	1st degree	27342	16485	3695
	2nd degree	50410	29634	
	Compensable disease plus Tb			4611
1991	Tuberculosis	13311	7657	2558
	1st degree	31444	19288	4508
	2nd degree	57972	34672	
	Compensable disease plus Tb			5626

Source: Annual Reports of the Compensation Commissioner for Occupational Diseases

Note: In the period 1973-1994, white and coloured workers were certified as having first degree conditions or second degree disease but there was no second degree category for black workers, who received first degree certification or were said to have compensable disease plus tuberculosis (cd+T).

Table 3.2 Real value of compensation payments under the ODMWA by racial and disease categories (1995=100)

Year	Disease	White	Coloured	Black
1973	Tuberculosis	74795	37398	8975
	1st degree	179509	89754	14959
	2nd degree	269263	134631	N/A
	Compensable disease plus Tb			17951
1980	Tuberculosis	44506	22256	5343
	1st degree	106814	53407	8901
	2nd degree	160221	80110	N/A
	compensable disease plus Tb			10687
1990	Tuberculosis	19738	11160	3574
	1st degree	46627	28112	6301
	2nd degree	85966	50536	N/A
	compensable disease plus Tb			7863
1991	Tuberculosis	19687	11325	3783
	1st degree	46507	28528	6668
	2nd degree	85743	51281	N/A
	compensable disease plus Tb			8321

Source: Compiled from data in the Annual Reports of the Compensation Commissioner for Occupational Diseases deflated by CPI.

Tables 3.1 and 3.2 illustrate the extent of racial discrimination in payments for occupational lung disease under the ODMWA. Between 1973 and 1980, the ratios of the values compensation payments for the three races remained constant (whites: coloureds: blacks 1: 0.50: 0.12). The 1990 and 1991 figures (the 1991 compensation amounts were still in place at the time of the 1993 amendments) indicate that compensation for black and coloured workers rose marginally relative to that for white workers in this period (1: 0.57: 0.18).

Table 3.2 shows that ODMWA compensation for the period 1973 to 1991 declined in real terms for all race categories. For white, coloured and black workers the real value of compensation for all types of compensable disease in 1980 was 60 per cent of what it had been in 1973. For white workers, by 1990, the real value of tuberculosis compensation and first degree disease compensation had fallen to 26 per cent of its value in 1973 while

compensation for second degree disease had fallen to 32 per cent of its value in 1973. For coloured workers, the corresponding figures were 30 per cent, 31 per cent and 38 per cent, respectively and for black workers 40 per cent, 42 per cent and 44 per cent, respectively.

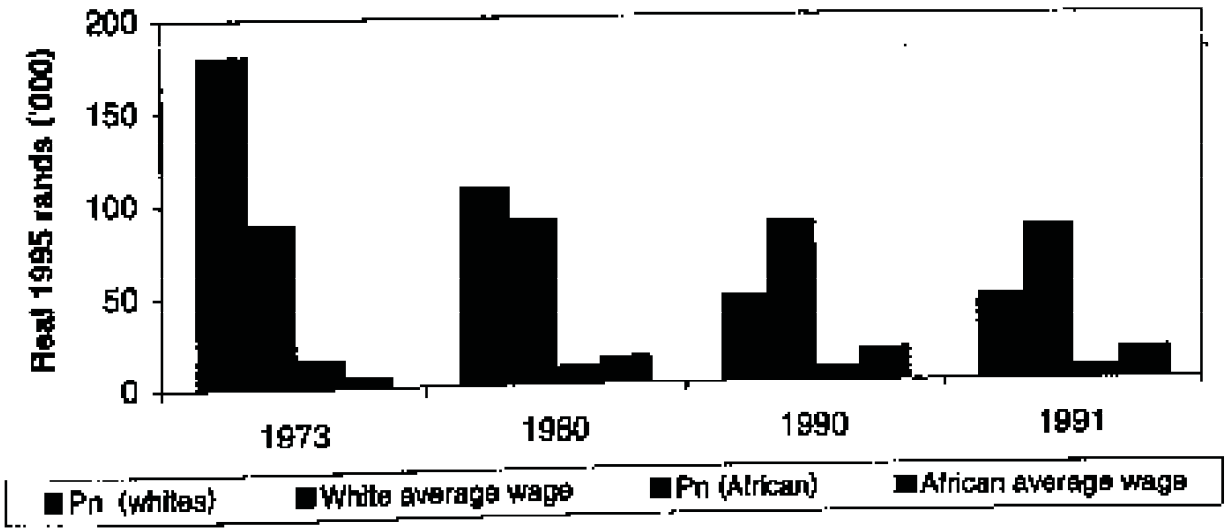


Figure 3.2 First degree pneumoconiosis compensation payments compared to annual average earnings 1973 to 1991 of white and black mineworkers in real (1995=100) rands

Source: Wage data compiled by National Union of Mineworkers in submission to Commission of Enquiry into Safety and Health in the Mining Industry (Leon Comission). Compensation payments calculated from data in the Annual Reports of the Compensation Commissioner for Occupational Diseases

When one compares ODMWA compensation payments for the period 1973 to 1990 with average wages, it is seen that the rate of increase in compensation payments did not keep pace with increases in wages for any racial categories. This failure to keep up with wage increases was especially marked in the period 1973 to 1980 for black workers whose wages rose rapidly over this period. Table 3.3 compares the compensation payment for each category of compensation as a percentage of the annual average nominal wage by race.

Table 3.3: Compensation payments as a percentage of annual average wages by race category: 1973, 1980 and1990

(Year) Race Category	Wage (Rands)	Per cent of wage for Tb compensation	Per cent of wage for Pn1 compensation	Per cent of wage for Pn2 / CD +T
1973				
African	350	171	285	343
White	5 881	85	204	306
1980				
African	2 037	39	65	65
White	13 305	50	120	180
1990				
African	10 087	25	45	56
White	51 030	23	62	114

Source: Calculated from data in the Annual Reports of the Compensation Commissioner for Occupational Diseases

Subsequent to the amendments, the average white annual earnings in 1994 were R70, 088. Hence, the maximum second degree compensation payment of R70 000 on such a salary represents approximately 100 per cent of annual earnings. The average black annual salary in 1994 was R14 477. Therefore, a second degree compensation payment on such a salary would be R42 214 which represents 292 per cent of annual salary. The ODMWA amendments represent a substantial increase in compensation relative to wages for black mineworkers and a moderate reduction relative to wages for white workers. Changes in the real (purchasing price) value of compensation payments over time, require explanation. In her historical study of workers' compensation, Budlender argues that occupational health and safety concessions granted to white workers were an expression of their political and economic power and their relationship with the social order of the day. She points out that workers' compensation legislation and amendments were passed at times of crisis: 'in 1924 with the PACT government, 1934 after the depression, and in 1941 in the middle of the war'.[1] The trend in the real value of compensation payments can be seen as reflecting a shift over time in the political and economic power of various sections of the mine labour force and their relationship with employers and government. The 1993 ODMWA amendments introduced a salary-based compensation system with a salary ceiling of R2000 per month (as opposed to the previous race-based system), resulting in a substantial increase in benefits for black workers. Their benefits for pneumoconiosis in the first degree, rose from R4508 to a maximum of R31 400. For black workers with second degree disease, this increase in benefits was further enhanced by the fact that prior to 1993, there was no clear distinction in law

between first and second degree disease in black workers. For them, the change represented an average increase in compensation awards of 735 per cent, with a maximum increase of 1553 per cent from a maximum benefit of R5626 for compensable disease plus tuberculosis to a maximum benefit of R70 000 for second degree illness. De-racialised, wage-based compensation with a salary ceiling, resulted in a further drop in benefits for white workers. The maximum payment of R70, 000 represents less than white workers were eligible for under the previous dispensation. In 1995 Rands, second degree payments under the pre-amendment dispensation would be worth R85 000.

Abdullah *et al.* argue that despite the amendments, the large wage gap between black and white workers, leaves residual discrimination.[2] There is an attempt in the amendment to the Act to reduce the effect of the wage gap in compensation by including payment in kind of food, accommodation and overtime in the calculation of wages, and also by putting a ceiling of R2000 per month in wages to compensation calculations.[1] However, this still means that formal equality belies the perpetuation of historically race-based occupational divisions. In short, the Amendment Act disadvantages black mineworkers.

3.3 Conclusion

The value of the ODMWA levy has fallen for all races since its inception and has failed to keep pace with wage increases. The implications of the decline in the contributions for the ability of the fund to meet the unpaid compensation liability will be taken up later in this thesis once the burden of disease has been presented. The research levy has also fallen considerably. This fall shows a lack of commitment to research about occupational lung disease in mineworkers. The scarcity of research has resulted in a situation in which contributions to the ODMWA Fund have been based on assumptions about disease prevalence. This thesis will show that the assumptions about disease prevalence have been under estimates. As a consequence of these underestimates the levies collected have inadequately provided for the potential draw down on the Fund.

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[1] This amounts to R305 in board and lodging costs. Overtime is calculated on an individual basis using mine records and the compensation commissioner does not include it in the payments to ex-mineworkers. Personal communication 22/10/97 Mrs Van Den Berg ODMWA Compensation Commissioner.

[1] Budlender D. Labour Legislation in South Africa 1924-1945. (Master of Arts dissertation).Cape Town: University of Cape Town, 1979.

[2]Abdullah F, Jeebhay M, Myers J. Opinion: Occupational Diseases in Mines and Works Amendment Act, 1993. South African Medical Journal. 1994; 84:132-133.

CHAPTER 4

Analysing the Social and Economic Burden of Occupational Disease

"The majority of mineworkers are and will continue for some time to be migrants. They may come from within South Africa or from any of the countries of the subcontinent. As a result it is essential to examine workers at regular intervals after they have retired from active employment. Practically, no facilities exist for the examination and investigation of former mineworkers, either in this country or adjoining states."

Commission of Inquiry into Safety and Health in the Mining Industry. Leon RN, Chairperson. Pretoria: Department of Minerals and Energy 1995. 4.1.4: 42.

"The mines take the flower of our youth and they give us back rubbish" - Mrs Bene, Libode woman at community meeting. March 11 1996

4.1 Introduction

In this chapter, aspects of the migrant labour system found on the South African gold mines, involving the reproduction of the labour force, are discussed in order to clarify the implications for health and health care provision. The term 'disease burden' is used in epidemiology to describe the morbidity and mortality which arise from a given prevalence and/or incidence of a particular condition, but I will argue that the meaning of this term can usefully be broadened to include the medical, social and economic consequences of disease for the viability of households and communities. The discussion in this chapter focuses on the burden that mining-related occupational lung disease places upon individuals, households and communities. It is possible to show that morbidity and premature mortality among breadwinners due to occupational lung disease has substantially reduced the medical, economic and social viability of affected households, and has contributed to the overall impoverishment of labour sending communities such as Libode.

The analysis presented here assumes, for the purpose of exposition, that the prevalence of occupational disease experienced by ex-mineworkers in labour sending communities is considerable. In subsequent chapters, the actual prevalence of occupational lung disease in the

sample population is presented and the theoretical work discussed below is then used to develop quantitative models with which to assess disease burden. This chapter provides the theoretical framework upon which models are built in later chapters.

4.2 Rural subsidisation of labour renewal - the rural family as 'field hospital'

A useful starting point for a discussion on the role of the rural family in maintaining the necessary conditions for labour migrancy, is Marx's theory of reproduction of the labour force in capitalist society, in which the 'reproduction of the labour force' involves 'maintenance' and 'renewal'.[1] Maintenance includes processes that sustain the individual worker and renewal those processes which provide the next generation of workers. Wolpe, in his analysis of the South African migrant labour system, stresses that as a consequence of this system, the costs of renewal of the labour force are borne largely by the communities from which the labour is drawn, thereby reducing the direct cost of labour to employers.[2] In effect, according to Wolpe, the rural economy has historically subsidised the mining industry. Wolpe has argued that through the migrant labour system, subsistence production in rural areas serves to 'maintain' and 'renew' the migrant families. He notes that apartheid land removals denied black people access to land, arrested capitalist agriculture amongst black farmers and undermined the ability of rural households to maintain and renew the migrant workforce. Wolpe explains that the homeland system was introduced as a method of establishing a political system in which communal access to limited land was guaranteed to 'citizens' and that the maintenance and renewal functions of labour sending households could thereby be perpetuated.

Cohen extends the subsidisation argument, finding that not only the overall economic costs but also the social and health costs of labour migration are borne by the communities in labour reservoirs.[3] In his view, the rural migrant household ensures the survival of future generations of labourers by acting as a site of renewal, repair and recuperation for exhausted workers. Cohen argues that in the event of sickness, injury and disability, the rural migrant households become field hospitals; and that when workers are retrenched, medically repatriated or reach old age, the rural household provides the only available substitute for unemployment benefits, redundancy, workers compensation payments, and pensions.

The heavy burden of disease brought back to labour sending communities and the burden that

falls on the communities which support ex-workers, is eloquently expressed in the African Mineworkers' Union submission to the 1943 Witwatersrand Gold Mines Native Wages Commission:

> "the men bring home tuberculosis. ... often in the infectious stages. There are few hospitals in the Native Areas. There is only one hospital in the Transkei - at Umtata. There are no measures taken to prevent the spread of these diseases. No provisions are made for treating and isolating sufferers. They are left to spread death to the women and children in their homes. Not only do men who go to the mines fail to improve the economic conditions at home, but they actually add to the burden, for many come home ill and disabled, with minute pensions, and the land must now support them."[4]

Cohen contends that the rural household not only renews the labour force but also attempts to heal people who are worn or damaged through their work. The research undertaken by Arkles on mining-related disability in labour sending communities in Lesotho clearly demonstrates how poorly equipped such communities and households are to take on the role of the 'field hospital'.[5] Arkles argues that as access to viable land decreases, rural communities become less able to subsidise, through agriculture, the social and economic costs of providing for the needs of migrant families with a disabled breadwinner. In the process, rural communities have become increasingly dependent on wage labour and increasingly locked into a cycle of impoverishment and dependency.

Herein lies the nub of the problem of underdevelopment in the rural labour sending areas. These areas are confronted by a diminished ability to support ex-mineworkers at the same time as the need for such support is growing. This situation has arisen from the interplay of several factors. First, the contribution of subsistence agriculture to the support of the rural households is low. While, by definition, subsistence agriculture is not for sale and hence does not provide direct monetary income, the latter can be inferred for such production. In 1980, data for families with incomes of less than R1500 per year show that 66-71 per cent of total income came from mine wage remittances, 14-19 per cent from pensions and 11-15 per cent from local job wages. Only two percent came from subsistence agriculture.[6] The marginal role of agriculture in supporting labour sending communities is also shown by a 1995 study of the dependants of Anglo American Corporation employees in the Lusikisiki District. The survey found that 93 per cent of dependants had no income other than mine wage remittances.[7]

Secondly, the total number of jobs available in gold mining has declined by one third over the past decade and is expected to decline further as the gold mining industry matures. Thirdly, the ability of the economy to absorb retrenched workers and school leavers is limited. As greater numbers of ex-mineworkers return to their areas of origin, they become part of communities which are increasingly unable to provide for their social, economic and health needs. Fourthly, in a labour market with an over-supply of low-skilled workers, ex-mineworkers with occupational lung disease are doubly disadvantaged. Arkles notes that in a Southern African context, where workers often have low levels of education, and job opportunities are both centred around the mining industry and are largely of a strenuous physical nature, a relatively small disability such as an abnormal chest X-ray or reduction in lung function can result in an almost total loss of employment opportunities.[8]

The long-term damage to labour sending areas resulting from the impact of migrancy on the family, has been thoroughly investigated. Wilson clearly documents the detrimental effect that migrant labour has on the cohesiveness of the migrant family. She argues that prolonged absences of husbands and fathers has been associated with emotional trauma, high rates of conjugal breakdown, large numbers of illegitimate children and instability in arrangements for rearing children.[9] Wilson's view, based on a lifetime of work in Southern Africa, is unequivocal:

> "migrant labour, continuing over a long period of time and involving a substantial proportion of the population is, I believe, the single most destructive force in our society... South Africa has lived on the capital of a very strong African family system and that capital has been squandered".

Given that the migrant labour system is a crucial factor contributing to the breakdown of family structures, families are placed under additional stress when a mineworker succumbs to disease or disability.[i]

The social and economic consequences of disabling work injuries for migrant workers and their families and the inadequacy of relevant legislation protecting workers who experience a serious accident at work, have been examined by Arkles in relation to ex-mineworkers in

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[i] Despite the above, Coplan's anthropological study of the songs of Basotho migrants indicates that migrant workers have an immense 'psychic investment' in the rural cultural world and in the fiction of an economically viable rural life which greatly affects life choices and strategies.

Lesotho.[10] She notes that disability in ex-mineworkers results in 'repatriations, retrenchments and resignations and a consequent slide into impoverishment in rural households, which compensation legislation fails to protect against'. Arkles argues that workers' compensation should play an important role in ensuring the long-term viability of rural communities but so long as the migrant labour system keeps the price of labour down and while there is a substantial pool of ever more economically desperate potential workers in the labour sending areas, the mining industry will have no incentive either to provide adequate compensation or to reduce the risk of disease on the mines. Phua states that the increased levels of production and margins of profit that can be gained by addressing health and safety are only attractive to employers in a tight labour market where employers are competing for workers.[11] Extensive unemployment or underemployment means that death and disability do not impose significant economic costs on the mining industry because workers are easy to recruit and to replace. Furthermore, since the industry has traditionally relied on a relatively low-skilled workforce, retraining costs are low.

The submission by the Chamber of Mines to the Leon Commission advances the view that improved health and safety standards would result in higher costs and lower levels of employment which would, in turn, have a negative impact on workers and their families.[12] The Chamber of Mines argues that the gain to workers and their families resulting from reduced accidents and disease would be less than the loss resulting from unemployment. Using a model designed by Professor Bernard Cohen of the Physics and Radiation Health Department at the University of Pittsburgh, they attempt to provide a socio-economic quantification of risk in terms of loss of life expectancy (LLE). Cohen's model was designed to assess the risk of the nuclear industry relative to the costs of the strict safety standards imposed on that industry. The authors of the COM submission argue that while mine fatalities carry an LLE of only 82 days, unemployment carries an LLE of ten years (forty times greater). They provide no LLE data for occupational lung disease. This model is flawed in several ways. First, it argues by assertion without supplying references for the data cited. Secondly, the model works on the assumption that if 20 people lose one year of life expectancy, then this is equivalent to one person losing 20 years. These are not equivalent states. If every man in the Transkei were to die at 59 rather than at 60, this would not be equivalent to 5 per cent of Transkeian men dying at 40 rather than at 60. The LLE would be the same but the social, economic and emotional costs are not the same, because those years of earning that are foregone, occur at different points in a family's life cycle of support from

income earners for dependants. Whatever impact poverty has does not detract from the consequences of mine accidents or premature death from occupational lung disease. The model is based on the comparison of poverty with mine accidents, this is an invalid comparison. If comparisons are to be made, fatalities from mine accidents must be compared with fatalities from accidents in industries other than the mining industry. The comparison between mine accidents and poverty may tell us something about the *weltenshang* of the authors but it is not scientifically meaningful. Finally, in their response to this submission, the NUM argues that in the model:

> "the Chamber eMBODies a conception of cost that does not take account of the full extent of the cost of lack of health and safety in South African mines. It ignores the high cost that is borne by injured and diseased mineworkers, their families, the communities in which they reside and society generally. In South Africa, this displacement of costs is exacerbated by the inadequacy of the compensation system which in the mining industry is inferior to other industries".[19]

Later in this chapter, a more recent and more appropriate model for quantifying the cost of occupational disease and injury which has been developed by the Health and Safety Executive of Great Britain, will be discussed.

Because of the economic peculiarities of the gold mining industry referred to in Chapter one, attention has been focussed on controlling the working costs in general and labour costs in particular. Raising per capita productivity is the main goal of recent technological, training and managerial initiatives. The industry is attempting to move towards a smaller, more highly skilled and more productive workforce through skills upgrading and a broadening of worker responsibility through multi-skilling, reorganisation of working practices and changing of working time. Driven by weak gold prices, shareholder dissatisfaction and the costs and complexity of having to mine more difficult to-get-at ore reserves, these initiatives have been developing at mine level and at mining house level since the early 1990s. The 1997 wage settlement agreement between the NUM and the COM, linking wages to productivity, is a recent expression of this trend towards a smaller, more skilled, productive workforce. The corporate restructuring of the mid-1990's has transformed the face of South Africa's staid mining finance houses (leaving only AngloGold, AvGold, GoldFields, RandGold and the remains of JCI). This restructuring has produced a smaller number of focussed gold mining companies. These moves belatedly seek to respond to shareholder pressure and the impact of

globalisation, in which South African mining houses compare unfavourably with other international mining companies. The changes belatedly seek to match changes in mining work practices with appropriate corporate structures. These recent innovations represent a departure from the past methods of labour organisation, in addition to which the historical reliance on the ability to recruit readily available, cheap, low-skilled labour, is beginning to breakdown. If these trends continue and the implied changes are brought about, the industry will have to reappraise the economic consequences of labour replacement resulting from occupational disease and disability.

4.3 Mining-generated externalities

In economics, 'externalities' are those factors which are not included by an industry as direct costs of that industry but are generated by that industry and which have an adverse impact on human welfare or the environment. Pollution is a commonly cited externality. Eckholm argues:

> "health hazards in the workplace represent production costs that have seldom been counted, let alone billed to those responsible for them. Interjecting both worker and community health considerations more fully into the economic decisions will promote worker protection. It will also insure that, when prevention fails, workers will be more justly compensated for their sacrifices."[14]

In the context of this thesis, the social cost of occupational lung disease can be thought of as an externality of the South African mining industry. Mr. Bobby Godsell (Chief Executive, AngloGold) has stated that:

> "South Africa may have to choose between requiring the industry to compensate for past injustices and protecting present jobs."[15]

This statement implies that the costs of silicosis in mines should continue to be externalised from the mining industry and borne by the state rather than by the mining industry for the sake of short-term job preservation. Mr Lesley Boyd (Deputy Chairman, Anglo American Corporation), is of the opinion that South African government spending must be drastically reduced. If one assumes that this spending cut is to include health care and social services provided for labour sending communities, the logical conclusion must be that the burden of occupational disease amongst ex-workers and labour sending communities should be written