

group will be discussed here. Fifty nine per cent (37 people) of those eligible for compensation, or their survivors, reported not having received their results from the MBOD. Of those who stated that they had received no letter from either the MBOD or the Compensation Commission, 51 per cent (19 people) confirmed that the address on the copy of the MBOD letter was correct (an apparent case of letters getting lost or stolen in the post). In 11 per cent of cases (7 men), the address on the medical benefit form had been incorrectly transcribed onto the MBOD letter. Ten percent (6 people) were dead. Two per cent (one man) was in jail (for a cattle theft revenge killing) and his mail had not been forwarded to him.¹¹ In the remaining cases the reasons for non receipt were not apparent.

In addition to the cases of people eligible for compensation but who failed to receive their diagnoses, six members of the random sample study group stated that letters from the MBOD were sent to the wrong person — two people's letters were put in one envelope and posted to one of the persons concerned. Given the potential for letters to be lost in this way, it is possible that there were more such cases that went unreported. This can be seen as a breach of medical confidentiality. It also could result in people not getting their MBOD results. The non-receipt of letters is a serious problem as no reminder is sent by the MBOD or the Compensation Commission; and after three months, the Compensation Commission simply files the case. The non-receipt of letters from the MBOD is also problematic in that appeals need to be lodged with the reviewing committee within 90 days of the original decision having been made.

Thirdly, there were complications that related more generally to issues such as poverty and illiteracy and limited or no banking facilities in rural communities. It is clear from the problems that did occur, that the compensation system, as it currently exists, was not designed with rural ex-mineworkers in mind. Sixty per cent (142 people) of the random sample group with rural ex-mineworkers in mind. Sixty per cent (142 people) of the random sample group could not sign their names on the consent form for the study. While people reported that they could find someone who could read isiXhosa, they said that finding someone who could read English was much more difficult. The letters from the MBOD and the Compensation Commission are only sent in English and Afrikaans. The apparent inability of the MBOD to

¹¹ The study subject had, subsequent to his medical examination, been involved in a cattle theft revenge killing. The prison warders at the Umkato Prison were very helpful. The study fieldworker was allowed to complete compensation forms with the prisoner and the prisoner was escorted to his bank of choice in order to open an account. The prisoner was very forthright in his wish that his family should not be allowed to draw on his compensation money in his absence.

communicate medical information in a language that the patient understands, is in violation of the South African Health Rights Charter.⁶

Payment of compensation is further hampered by a limited knowledge of banking facilities and the inaccessibility of those that do exist. Only two people had existing bank accounts and both of these were with the Transkei National Building Society (TNBS). The financial institutions that were brought into existence under the homeland governments were not registered as South African banks at the time and the Compensation Commissioner would not send money to them because a charge was involved. As a result, these cheques were posted. In one case the postage of the compensation cheque led to theft.ⁱⁱⁱ On enquiry, the compensation office workers explained that money is sent to Mozambican ex-mineworkers via the Mozambican Department of Labour or through TEBA. Botswanan workers are sent their benefits as a bank draft, for which the worker is charged. Lesotho-based ex-mineworkers receive their benefits in the post or via a TEBA account. The staff at the Compensation Commission reported having no knowledge of any cheques ever having been sent to either Malawi or Zimbabwe. The banks with South African registration which have branches in Umtata, are the First National Bank and Standard Bank. Initially, both banks stated that they would not open accounts for people without a regular source of income, regardless of the imminent arrival of compensation moneys. The reason they gave was based on a perception that 'these people' tend to withdraw all the money in a very short period of time. There have also been problems relating to opening bank accounts without current South African Identity Documents. After discussions with the principle investigator, the Umtata representative of the National Union of Mineworkers persuaded the banks to stop turning away people who had Transkeian but not South African identity documents (three people were initially turned away). In the former Transkei, there is still a long waiting list for new identity documents.

Death was a major cause of failure to claim compensation moneys. The fieldwork for the Libode study was undertaken in March 1996. By March 1997, six of the random sample

ⁱⁱⁱ This case was uncovered when the study subject visited the study fieldworker in order to ask when his money would arrive. The money had been sent six months previously. On investigation, it was found that the cheque had been cashed and returned to the Compensation Commission. The signature on the back of the cheque purported to come from the study subject but contained a spelling mistake in the subject's name and a rubber stamp from a trading store in Qumbu where the subject received mail. It was found that the shop keeper had fraudulently signed the cheque over to himself and deposited it into his own account. The local police appeared reluctant to act against the shop keeper and thanks are due to Sergeant Mqoqi of the Umtata Police who took over the case, arrested and prosecuted the shopkeeper and returned the money to the study subject.

compensable cases had been reported as dead to the fieldworker. The average age of the dead men was 55 years (range 34-78). This underlines the need to create a culture of occupational disease awareness in labour sending communities, and among mineworkers and their families, particularly as the legislation makes provision for compensation claims on autopsy. It is estimated that autopsies are performed on 86 per cent of white mineworkers.⁷ This indicates a high level of awareness amongst such workers families of the provision for a final attempt at claiming compensation. The application forms issued by the ODMWA Compensation Commissioner is reproduced in appendix five.

10.6 Conclusion

Results presented above show that while there was a high degree of concordance between the decisions made by the radiological readers involved in this analysis and a relatively high degree of agreement between the ILO findings of all the readers and the results of the MBOD Medical Certification Committee, there were a few cases in which only very minimal or doubtful radiological change was certified as compensable and many more cases in which there was clear radiological change but the persons concerned were certified as having no compensable disease. The results indicate the need for clear, consistently applied and readily available guidelines as to the thresholds pertaining to compensable disease as used by the Certification Committee, for the benefit of mineworkers, sending doctors and staff at the MBOD.

While the Libode random sample constituted 1.5 per cent of all cases reported to the MBOD, they made up 4 per cent of those paid out by the Compensation Commissioner in the period 1/4/96 – 31/3/97. As discussed in chapter eight, 62 per cent of the random sample had not received any previous compensation. Only two per cent had previously been compensated in full. This suggests a failure of medical surveillance and compensation systems, both on the mines and also in the rural labour sending areas.

The problems encountered by the Libode ex-mineworkers in their attempts to file compensation claims, indicate that the current system was not designed with rural communities in mind. Failure to consider the circumstances in which rural ex-mineworkers live is problematic, considering that the vast majority of workers are migrants from rural districts. Data presented above suggest that this failure has resulted in the accumulation of a large unpaid liability of compensable occupational lung disease. The extent of the unpaid

liability will be examined in more detail in a subsequent chapter. Any attempt at reform in order to promote equitable and effective public services, would need to take into account the conditions in rural areas.

¹ Prof JCA Davies, personal communication.

² Geddes EW. The changing role of the Medical Bureau for Occupational Diseases. Unpublished address to the Mine Medical Association of South Africa, 1997.

³ Personal communication Mrs Irena Van den Berg, ODMWA Compensation Commissioner, May 1998.

⁴ Leger JP. Fatalities, disability and disease in the South African mines. A submission to the Commission of inquiry into safety and health in the mining industry. Leon RN, chairperson. Pretoria: Department of Mineral and Energy, 1995.

⁵ Personal communication Dr A Halliday, Medical Bureau Occupational Diseases, 1994.

⁶ National Progressive Primary Health Care Network. South African health rights charter. Johannesburg: NPPHC, 1997.

⁷ Becklake MR, Irwig L, Kielkowski D, Webster I, De Beer M, Landau S. The predictors of emphysema in South African gold miners. *American Review of Respiratory Disease* 1987;135:1234-1241.

CHAPTER 11

Estimating the ODMWA Compensation Liability

11.1 Introduction

Earlier chapters have demonstrated the high rates of previously unpaid compensable disease in the study group. This chapter will estimate the economic cost of the unpaid liability of compensation for occupational lung diseases under the ODMWA.

Quantification of the extent of the liability in respect of unpaid occupational disease compensation is hampered by the absence of accurate denominator data relating to the number of former gold mineworkers. It is also complicated by the distinction between a theoretical claim (i.e. mineworkers with pneumoconiosis) and an actual claim (i.e. mineworkers with pneumoconiosis and access to a benefit examination). An assessment of the liability, both actual and theoretical, will be presented below.

11.2 Theoretical liability

Based on available data, White has calculated a denominator estimate of approximately two million mineworkers who were employed in the period 1973 - 1997, 70 per cent of whom he estimated to be South African citizens.¹ Data from the annual reports from the MBOD show that between 1973 and 1997, 37 598 men were certified as having pneumoconiosis compensable under the ODMWA and 107 171 were certified with tuberculosis.

Data from Libode suggest that 260 per 1000 have compensable pneumoconiosis and 333 per 1000 have a history of tuberculosis. The best available data indicate that 34 per cent of tuberculosis among ex-mineworkers can be attributed to mining.² The best estimate of tuberculosis attributable to mining is thus 113 per 1000. Extrapolation to the total population of ex-mineworkers, assuming the same prevalence, suggests that there are an estimated 520 000 cases of compensable silicosis and an estimated 226 000 cases of attributable tuberculosis. The difference between the reported and the estimated cases of pneumoconiosis is 482 402 and the difference between the reported and the estimated cases of attributable tuberculosis is 215 283. White estimates that 60 per cent of the two million gold mineworkers employed between 1973 and 1997 are still alive.³ This means that there are an estimated 289

441 cases of compensable pneumoconiosis (202 609 inside South Africa and 86 832 outside South Africa). On the basis of existing data, it is impossible to assess how much of the attributable tuberculosis is compensable. All one can say is that the cost of attributable tuberculosis currently falls on the state health services and the community and that some of this disease would be compensable.

Using the Libode compensation data as a model, cases of compensable pneumoconiosis generated by the gold mines between 1973 and 1997 can be estimated. The estimated liability of unpaid compensation under the ODMWA is shown in Table 11.1.

Table 11.1 Estimated liability of current unpaid occupational lung disease compensation

	No of cases	Pn1 MZAR	Pn2 new cases MZAR	Pn2 upgrade MZAR	Total MZAR
Not eligible for further compensation	5789				0
South African cases	198557	1814	2018	2 472	6304
Foreign cases	85096	778	865	1060	2702
Total		2592	2882	3532	9006

Pn1 = compensation for first degree pneumoconiosis; Pn2 new = compensation for second degree pneumoconiosis for men with no previous history of compensation; Pn2 upgrade = compensation for second degree pneumoconiosis for men with a previous history of compensation but with disease progression. MZAR = Millions, South African Rand

The data show that an estimated 6304 MZAR is owing to South African nationals suffering from compensable lung disease. When amounts for which foreign nationals are eligible is added the total, the unpaid liability rises to 9 006 MZAR (the compensation legislation makes provision for all mineworkers to receive benefits, regardless of nationality).

11.3 Actual liability

As stated above, the 9 billion Rand in unpaid ODMWA compensation is hypothetical rather than actual, until it is claimed. Theoretically, this amount of money is payable even if the gold mines were to close down immediately. Practically, it is unlikely that all those with a theoretical claim will be able to access an ODMWA medical benefit examination before they die.

In line with one of the key aims of this thesis, i.e. the setting out of viable solutions to the problem of rural occupational lung disease in former mineworkers, Table 11.2 provides a

viable schedule for benefit examinations for the surviving workers employed between 1973 and 1997. The model assumes that a substantial proportion of workers will die while awaiting a benefit examination. It also assumes that the current number of 25 000 benefit examinations carried out on former mineworkers seen by the MBOD Certification Committee can be raised by 15 per cent per annum to a ceiling of 50 000. Such an increase in the number of medical examinations could be achieved by amending the ODMWA in order to allow nurses to undertake the examinations. Furthermore, general practitioners in rural areas could be educated as to the provisions in the ODMWA. This would improve the delivery of benefit examinations to former mineworkers based in rural communities where the lack of doctors currently prevents the completion of benefit examinations. The use of nursing staff would also lower costs of providing benefit examinations. This requires a recommendation from the Director of the MBOD and final approval from the Minister of Health.

Table 11.2 shows that the liability in respect of claimants who stand a chance of accessing a benefit examination prior to their death is considerably lower than the theoretical liability presented in Table 11.1. Table 11.2 indicates that within eleven years, all men who worked between 1973 and 1997 and who survive long enough to receive a benefit examination, can have had one such examination; and that the actual liability is 2139 MZAR.

11.4 Fund liability

The liability of the ODMWA Compensation Fund can be divided into that pertaining to those workers employed in the period 1973 to 1997; and to the limited number of new recruits employed subsequent to 1997. As has been discussed above, the best estimate (based on available data) of the theoretical unpaid liability of the ODMWA Compensation Fund in respect of uncompensated pneumoconiosis in gold mineworkers working 1973-1997, has been estimated at MZAR 9006. The best estimate as to the actual liability (i.e. the cases that can realistically be thought to stand a chance of receiving a benefit examination) is 2139 MZAR.

In addition to those working 1973-1997, there are also currently 340 000 in-service gold mineworkers. Many of these individuals are long-serving mineworkers who have already been included in the calculations of men employed between 1973 and 1997. As has been previously discussed, the gold mining industry is contracting in size and is not engaging in large-scale recruitment of novices. There are currently 340, 000 men employed in the South

African gold mining industry but it is not clear to what extent additional job losses will occur. If one assumes that the numbers will remain at 340 000 and that the average working life of a gold mineworker is ten years, then recruitment would need to take place at a rate of roughly 10 per cent new employees per annum (i.e. 34 000) in order to maintain the size of the current workforce. If the industry reduces its workforce still further, at a rate of 10 per cent per annum there would be no need for new recruits and the reduction could take place through natural wastage. An assessment of the impact of these two scenarios on the liability of the ODMWA Compensation Fund, will be discussed below.

I will first consider the consequences of the workforce size remaining stable, requiring a ten per cent recruitment of new workers per annum. This would result in 34 000 men joining the industry on an annual basis. Previous studies have shown that the mean time between first exposure and pneumoconiosis is ten years and that 26 per cent of men so exposed get compensable pneumoconiosis.⁴ This assumes that there is no reduction in dust levels. Given the above, one should expect 8840 new cases per year. Using an average payment of ZAR35 000, this gives a future liability of MZAR309 per year.

The second scenario suggests that the South African gold mining industry will contract at the rate of 10 per cent per annum. There would be no need for new recruits and, consequently, no unaccounted-for compensable occupational disease cases.

In addition to compensation for pneumoconiosis, in-service workers are entitled to limited compensation for tuberculosis. A recent actuarial report commissioned by the ODMWA Compensation Commissioner shows that the cost of compensation for tuberculosis for the year 1997/98 amounts to MZAR31.⁵

Assume an actual liability for those working between 1973 and 1997 of 2139 MZAR, payable over eleven years. Assume that the cost of tuberculosis compensation will be approximately MZAR31 per annum. The total annual cost to the ODMWA Compensation Fund would then be likely to be approximately R225 million per year, which was approximately 0.96 per cent of gold sales (MZAR23 473) in 1995.

The projections for the more distant future are less clear in that these depend on factors such as the possible reduction in the size of the gold mining workforce and the possible reduction in the dust levels. If the gold mining industry was to remain at its current size with no reduction in dust levels, then it is estimated that by 2008 (assuming a ten-year latent period

since first exposure to silica) this will result in an annual cost of compensable disease of MZAR 296.

The above calculations do not take the HIV epidemic into account. It is not clear whether this will increase or reduce the compensation liability. It is possible that many mineworkers will die of AIDS before pneumoconiosis can manifest and hence not be eligible for compensation. However, it is also possible that the HIV epidemic will result in greater numbers of men with pneumoconiosis presenting with and being certified as pneumoconiosis plus tuberculosis (a second degree condition). This would result in a higher average compensation payment.

11.5 Implications of the disease burden for the ODMWA Compensation Fund

It was noted in chapter two that the gold mining industry paid MZAR38 into the ODMWA Compensation Fund (by way of the dust levy) in the financial year 1996-7. The data presented above show that this would have to be increased by a factor of approximately 6 times simply to cover the theoretical liability owing to gold mineworkers. At present rates of paying into the levy, it will only be possible to pay out to 4.6 per cent of gold mineworkers theoretically eligible for pneumoconiosis compensation under the ODMWA and to 19.5 per cent of those whose claim is likely to become actual by being able to access a medical benefit examination. This study has shown that only two per cent of those with compensable pneumoconiosis in Libode have been previously compensated. Assuming that one can extrapolate from this low rate of compensating of those eligible in Libode to the broader ex-mineworker community in other mine labour sending areas, it is clear that the ODMWA Compensation Fund is viable only in-so-far as it assumes that the vast majority of ex-mineworkers have and will continue to have no *de facto* access to this compensation system.

In this context, it is alarming to note that a recent actuarial report commissioned by the ODMWA Compensation Commissioner makes the assumption that "five per cent of all employees diagnosed as suffering from a compensable disease other than tuberculosis (i.e. all potential certifications) are not actually certified."⁶ This assumption is made despite the data from the Thamaga study having been published prior to the publication of this actuarial report.⁷ On the basis of this assumption, the actuarial report states that "if the mining industry were to shut down with immediate effect, the fund would remain solvent."⁸ Based on this finding, this actuarial report proposed new dust levies (in Rands per risk shift) for 1998.

These dust levies were approved by the Minister for Health and adopted by the ODMWA Compensation Commissioner.

In conclusion, the data presented in the previous chapters have been used to estimate the current liability of unpaid compensation under the ODMWA and to evaluate the implications of the disease burden for the future viability of the Compensation Fund. Different scenarios for the likely extent of the future liability have been discussed. From this analysis, it is clear that the ODMWA Compensation Fund is viable only in-so-far as one assumes that the vast majority of ex-mineworkers have and will continue to have no *de facto* access to this compensation system. It is disturbing to note that the 1998 actuarial calculations which were used to set the dust levy and which have now been approved by the Minister of Health have implicitly made this assumption.

¹ White N. Dust related diseases in former miners - the ODMWA legacy. Occupational Health South Africa 1997;13:20-24.

² Hessel P. Sluis-Cremer GK. Protocol for the investigation of health effects of gold mining exposures among former miners in the republic of Transkei. Epidemiology. Research Unit Working Paper 11, 1986.

³ White N. 1997 op. cit.

⁴ Corbett, E, Churchyard G, Moyake T. The effects of HIV infection and silicosis on tuberculosis incidence in South African gold miners. Lancet. In press.

⁵ Sykes A, Smithson D. Valuation of the compensation fund and development of a revised levy system for the Compensation Commissioner for Occupational Diseases in Mines and Works Act. Johannesburg: NMG Risk Managers and Actuaries, 1997.

⁶ Sykes A, Smithson D. 1997 op. cit. 16.

⁷ Steen TW, Gyi KM, White NW, Gaabosianelwe T. Prevalence of occupational lung disease among Botswana men formerly employed in the South African mining industry. Occupational Environmental Medicine 1997;54:19-26.

⁸ Sykes A, Smithson D. 1997 op. cit. 21.

Table 11.2 Estimate of time period necessary to provide a benefit examination to all living gold mineworkers employed between 1973 and 1987 and derived compensation liability ('000)

Category	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Total pop. ex-mineworkers ¹	1200	1068	930	791	652	516	387	272	175	96	37
Death rate ex-mineworkers ²	10%	11.5%	13.2%	15.2%	17.4%	20.1%	23.1%	26.6%	30.5%	35.1%	40.4%
Ex-mineworkers deaths	120	123	123	120	114	104	89	72	53	34	15
Target population	1080	945	807	671	538	412	297	200	121	62	22
Examinations undertaken ³	25	29	33	38	44	50	50	50	50	50	50
Examinations ex gold mw ⁴	13	14	17	19	22	25	25	25	25	25	25
Shortfall ex gold mw	1068	930	791	652	516	387	272	175	96	37	-3
Compensation ⁵ (Rand)	113,750	130,813	150,434	173,000	198,949	228,792	228,792	228,792	228,792	228,792	228,792

Assumptions:

- 1) 2 million gold mineworkers, 1973-1997, 60% alive in 1997
- 2) 10% death rate, escalating at 15% per annum
- 3) 25 000 benefits per annum on ex-mineworkers
- 4) Half of all benefits on ex-workers are on ex-gold mineworkers
- 5) Twenty six percent compensible @ R35 000 each

CHAPTER 12

Internalised and Externalised Cost of Occupational Disease

"We eat the mine and the mine eats us"

June Nash, We eat the mine and the mine eats us.

12.1 Introduction

Thus far, this study has provided radiological, spirometric and symptomatic evidence to support the contention that there is a high prevalence of occupational lung disease in the study community. Evidence has been presented which shows that while much of this disease is compensable, most of it has not been compensated. Furthermore, the failure to compensate has externalised the disease burden on to rural households and state health facilities.

This chapter will assess the costs of occupational lung disease for rural households, state health services and mining employers. This assessment will be made in terms of the model developed by the British Health and Safety Executive (HSE). It was noted in earlier chapters that the application of the HSE model was hampered by the very limited data available to calculate societal costs of occupational disease for South African mine labour sending areas. This chapter presents data pertaining to the cost implications for rural households and health facilities. In an attempt to develop information on the social and economic costs of occupational disease, a questionnaire was administered to those random sample study subjects who were found to be eligible for compensation by the Medical Bureau for Occupational Diseases. The questionnaire was administered prior to receipt of compensation but subsequent to knowledge that compensation was to arrive. Where the primary beneficiary was deceased the widow or guardian of any dependent children underwent the questionnaire. A copy of the questionnaire is included as appendix 4. In June Nash's anthropological survey of Bolivian tin workers the study subjects stated that 'we eat the mine and the mine eats us'.¹ The results of the questionnaire described below show that this situation is equally true for Libode in that while mine wage remittances have been crucial to immediate household survival while in employment, the long term costs of mining disease are a considerable burden to rural households.

All data pertaining to the economic cost of occupational lung disease are given in 1995 Rand equivalents.

Chapter eleven estimated the extent of the unpaid liability of compensation under the ODMWA. In chapter thirteen the impact of this unpaid liability will be assessed for the ODMWA Compensation Fund and for the viability of the gold mining industry. It will be shown that while mining wages have been crucial to the immediate survival needs of the households in Libode community, occupational disease has incurred significant social costs.

12.2 Survey of the Impact of compensation on compensated study subjects

12.2.1 Dependency relationships

The average age of those members of the random sample found eligible for compensation, was 58 years (s.d. $\pm$ 9.34, range 42-77). Seventy six per cent of those found eligible for compensation were under the male retirement age of 65 years. Seventy per cent considered themselves to be unemployed rather than retired or self-employed. Seventy one per cent of respondents were married, 17 per cent were the widows of the primary beneficiary, 5 per cent were single and seven per cent were divorced. The mean number of children was 3.4 (s.d. $\pm$ 1.12, range 1-6). In order to evaluate the extent to which children were dependants of the compensation recipient, the questionnaire solicited information as to the amount paid monthly for food, transport and education of each child. Eighty eight per cent of children were entirely dependent on the compensation beneficiary for food, transport and education. Seventy one per cent of respondents stated that they had gained new dependants since being notified of their compensable status. The average number of new dependants was 2 (s.d. $\pm$ 2.5, range 0-12). Forty three per cent of respondents stated that prior to receiving compensation they were entirely dependant on a family member (17 per cent were dependent on the pension of their mother and 17 per cent survived on the mine wage remittances of a brother). Of those who stated that they were not economically dependent prior to compensation, 39 per cent said that they supported themselves on a state pension, 30 per cent stated that they sold livestock when they needed money, 17 per cent stated that they sold wood when they needed money and 13 per cent stated that they lived on their savings. Nobody reported receiving a pension or a disability benefit from the mining industry.

12.2.2 Medical expenses

Ninety per cent of the respondents stated that their health was worse than people of the same age in their community. Seventy six per cent stated that they were buying medicine on a regular basis, to ease respiratory disease symptoms. The majority of the medicines named were products to relieve respiratory symptoms (25% Bostol; 17 per cent were brands of rub for the chest; 9 per cent Woods Peppermint Cure; 9 per cent traditional remedies said to ease respiratory disease symptoms). Respondents were asked how often they bought the named medicine per month and how much each purchase cost them from this a monthly expenditure on medicines was calculated. The mean monthly expenditure on medicines was 65 Rand range 0 to 200 Rand. Hence the mean annual expenditure on medicines is 780 Rand.

Respondents were asked to name the health centre that they used most, to state how often they visited this health centre on a monthly basis and what, if anything, they paid in transport costs for each trip. From this information, monthly expenditure on transport to health facilities was calculated. The mean monthly expenditure was 13 Rand (± 14), range 0 - 80 Rand (17 per cent stated that they walked to the health centre). Hence, the mean annual expenditure on medically related transport is 156 Rand.

In addition to medicines that were purchased by the respondents, 60 per cent stated that they were receiving free medicines from the health centre. The respondents were asked to produce the drugs being given free and the names of these drugs were recorded. The majority of these drugs were for tuberculosis. Sixty eight per cent were INH 300mg and Rifadin 600 mg.ⁱ The cost of tuberculosis treatment and the extent to which tuberculosis in ex-mineworkers can be attributed to mining will be discussed later in this chapter.

12.2.3 Opportunity cost of time and resource allocation to disease

Ninety five per cent of respondents stated that a family member regularly gave up time to care for them (83 per cent of care givers were wives). Twenty one per cent stated that someone in their household had given up their job or schooling to care for them (33 per cent per cent daughter, 44 per cent niece, 11 per cent wife and 11 per cent brother). Ninety five per cent felt that their children had been denied opportunities that the children of people without

ⁱ This combination is not in line with Department of Health guidelines on treatment for tuberculosis. The correct drugs are included at the correct dosages but the guidelines suggest that a combination drug improves compliance and consequently reduces the chance of relapse and drug resistance.

occupational disease in their community had been afforded. Sixty per cent felt that the major denied opportunity was that of good health "I have infected my children with tuberculosis and they are not strong" was a common sentiment. Thirty six per cent felt that "I will die soon from this disease and my children will not have the guidance and support of a father, no one will care for them when I am gone." Seven per cent felt that money had been spent on medicines to relieve their occupational lung disease symptoms which might otherwise have been spent on education.

12.2.4 Compensation spending plans

When asked to name the main thing on which they would spend their compensation money, 38 per cent said they planned to pay for their childrens' education; 19 per cent wished to extend their houses, 14 per cent stated that they planned to buy livestock, seven per cent stated that they intended to buy a vehicle and start a taxi business, seven per cent planned to leave their money in the bank and live off the interest, five per cent planned to start spaza shops, five per cent planned to pay for doctors, three per cent planned to pay off old debts and three per cent planned to invest in a brick-making machine. Twenty two per cent listed income-generating equipment as their primary purchase.

12.2.5 Discussion of compensated study subject's responses to questionnaires

The data show that respondents are still of working age and are at a stage of their lives where they still have young, dependent children. The indirect transfer of resources to labour sending communities by way of mine wage remittances has been cited by the mining industry as a significant social and economic contribution to these communities. The submission of the Chamber of Mines to the Truth and Reconciliation Commission puts forward the view that "employment has been provided particularly for people from the deep rural areas and from neighbouring countries, contributing to economic activity in these areas".² The data collected from this questionnaire suggest that mining houses are no longer providing a significant degree of indirect economic support to ex-mineworkers with occupational lung disease in the study area. Current mine labour recruiting is such that only 17 per cent of respondents reported being dependent on the mine wage remittance of a family member and only four per cent of respondents' adult male children were said to be working on a mine. The above data suggests that the social and health costs of mining-related occupational lung disease are borne by the communities in labour reservoirs without direct support from compensation or indirect

support from mine wage remittances.

It is clear from the detailed work histories of the study subjects that employment outside the mining industry is very rare, so that when mineworkers were medically repatriated or retrenched, their involvement in wage labour ends. Chronic disease in a potentially economically active person results in a loss of income and adversely affects dependency ratios of households. Furthermore, this study has found evidence that already limited household resources are being diverted into buying medicines and paying medical transport costs. Occupational disease has been shown to place a burden on households in terms of time and resources devoted to care giving responsibilities. This was also found to be the case by Arkles in her study of disabled former mineworkers, who spoke of the assistance they required in order to perform the same physical tasks that they had previously carried out prior to the accident.³ There is also evidence of the sale of assets in the Libode study group, with several study subjects reporting "when I needed money, I sold livestock." In chapter five, it was discussed how once assets are gone, the chronically incapacitated household becomes deeply indebted and that the sale of assets results in households becoming very vulnerable to future shocks such as drought.

This survey suggested that compensation is being used by diseased ex-mineworkers to resume the role of provider, this having been interrupted by the cessation of income-earning activity from mine labour. The reported use of the money is for social investment (education of dependants) or productive investments (income-generating purchases). The formula by which compensation awards are determined, was discussed in chapter three and the maximum compensation award was shown to be equal to three years salary. Even if one puts forward the unlikely hypothesis that disease manifested only in 1996 and there were, consequently, no costs associated prior to the diagnosis of the disease during the course of this study, three years salary would not cover expenses to retirement age of 65 (added to which there are the consequences of disability as well). The level of compensation awarded does not match the income lost as a result of not having a full working life. If the compensation funds are spent on education, maintenance and medication, and assuming such expenditure were held constant, with an average compensation amount of 32 000 Rand, the compensation award would be used up in 3.6 years. The information contained in Arkles' study of compensation recipients supports the view that compensation is being used to attempt to resume the role of family provider.⁴ Arkles found that compensation recipients were still relied upon as the

primary breadwinner, in that compensation was the main source of income for rural households. Arkles notes that following a disabling accident, monthly income was vastly reduced in most cases and described a process in which compensation money became increasingly inadequate as dependants needs (such as schooling costs) grew with the passing years.

Many of the men compensated as a result of this study, listed income-generating projects amongst their plans for the compensation funds. Arkles found that a small number (22 per cent) of disabled ex-workers supplemented compensation payments with income-generating projects. However the amounts and regularity of the receipt of income actually generated, indicated problems with the lack of resources, equipment, transportation, terrain, sufficient markets and low skill levels, all of which mitigated against the productive potential of these initiatives. Seidman, reporting on the use to which retrenched mineworkers put their retrenchment packages found that the majority of mineworkers were unable to invest their packages, either because these were too small or because the men did not know what to do with the money.⁵ Most reported spending the money on fixing houses, paying debts and on family maintenance. One said "I saved my money in the bank and kept withdrawing it until it was finished."

The qualitative data gleaned from the questionnaires indicates that there is a substantial burden of occupational lung disease being borne by the individuals, households and communities in the study area. What follows, is an attempt to quantify the cost of uncompensated compensable disease and then to quantify the cost of occupational disease to the mining industry, the state health services and the labour sending areas.

12.3 Quantification of occupational lung disease costs in the gold mining industry

South African nationals have been separated out for the subsequent analysis of externalized costs because neither data for state-funded medical treatment costs nor individual expenditure for occupational disease are available for the neighbouring countries from which mine migrant labour is drawn.

As was touched upon briefly in chapter three, several studies in a number of countries have attempted to quantify the cost of occupational disease and accidents in relation to Gross Domestic Product (GDP). Andreoni argues:

"Occupational accidents and disease are costly. For the community as a whole, they represent a burden which is constantly growing and which affects the standard of living of everyone, to the point that one can well ask whether the money spent paying for them would not be better used in financing the efforts of all those who throughout the world, are devoting their knowledge and their research efforts to prevention. This is one good reason among many why we should know as accurately as possible the real cost of employment accidents and occupational diseases. The results of research and the statistical data published in many countries, especially industrialised ones, provide a certain amount of information which, however, shows how difficult it is to draw a precise list of the numerous elements which make up this cost. While some of these elements can be isolated and quantified easily, others are much more difficult to perceive accurately."⁶

The information given by Andreoni also gives an indication of the ratio of costs of occupational disease and accidents to GDP for several developed countries but he does not distinguish between costs of accidents and occupational disease. The ratio of cost to GDP varies from 1.17 per cent for the USA (1977), to 2.03 per cent for Italy (1980) and 3.25 per cent for France (1977).

A 1994 survey by the British Health and Safety Executive (HSE) has examined the cost to the British economy of occupational disease and injury.⁷ In this study, the costs to employers and also the costs to society of occupational disease, are listed and quantified. The key costs to employers are the payment of compensation levies, costs of medical treatment provided by the employer, administrative costs, medical and compensation services provided by the employer, loss of output (due to absence of sick workers), additional costs of maintaining output when workers are absent, costs of hiring and training new workers to replace those lost to disease, penalties payable for delays in meeting contractual obligations and loss of goodwill and reputation with the workforce, customers and the local community. In the HSE study, it was found that the total cost of occupational accidents and disease is far higher than had been previously thought because earlier studies had failed to take account of societal costs, which include the loss of resources (notably labour and capital), loss of future labour services from the victims, and loss of well being due to pain, grief, and suffering caused by premature death, and disablement. The HSE report concludes:

"The overall cost to the British economy of all work accidents (including avoidable non injury accidental events) and work related ill health is estimated to be between 8 and 12 billion pounds.

This is equivalent to between 1 per cent and 2 per cent of total Gross Domestic Product ... The total cost to society as a whole, including the estimate made for loss of welfare resulting from pain, grief, and suffering of individual victims and their families is estimated at between 11 billion and 16 billion pounds. This is equivalent to between 2 per cent and 3 per cent of total Gross Domestic Product, or a typical years economic growth. Illness accounts for about 4 to 5 billion pounds of this and accidents 6 to 11 billion pounds."

While recognising that the economy and the health and safety system in South Africa are very different to that found in England, one can nevertheless use this approach to assess the affect on the national economy of occupational disease and accidents. Application of the same macro ratios to South Africa suggests that the total annual cost to society can be estimated at between 9 681 MZAR and 14 522 MZAR in 1996. Good use can be made of the HSE methodology to construct a model to quantify the cost of occupational lung disease in the gold mining industry. The results obtained from applying this model, based on the assumptions stated, are shown in Table 12.1.

Table 12.1 Quantification of occupational lung disease costs born by the South African gold mining industry at current prices, for the 1996 workforce of 342 893 men in-service

Cost Category	Cost Category Components	Annual Value MZAR
Employers contribution to compensation fund ^a	Contribution of gold mine employers to Compensation Fund	38.0
Medical Surveillance	Periodical examination	137.2
	Loss of output during periodical exam ^c	128.6
Medical treatment provided by Employer	Tuberculosis ^d	
	Hospitalisation ^e	10.5
	Costs of drugs for treatment ^f	4.1
	Costs of MDR Tb treatment ^g	1.9
	Costs of DOTS staff salaries ^h	1.0
	Pneumoconiosis and Obstructive Airways Disease	
	Case finding and reporting to MBOD ⁱ	2.1
Loss of output for men with Tb	Remuneration costs ^j	20.4
	Cost of lost production ^k	118.5
Total costs		343.7

Notes

Model assumptions:

- a) Based on contribution from April 1996 to March 1997
- b) Estimated cost 400 ZAR per person
- c) Salary costs at 55 ZAR per day and production loss at 320 ZAR per day
- d) Assuming 2 per cent annual incidence
- e) Assuming 30 per cent of incident cases are hospitalised for an average of 17 days at 300 ZAR per day
- f) Assuming six months of treatment at 600 ZAR per course
- g) Assuming 2 per cent of Tb cases have multi-drug resistance costing 14 000 ZAR per course
- h) DOT staff salaries 2000 ZAR per month; one person per 8,000 men
- i) Including X-rays, medical staff, claim administration at 150 ZAR per patient assuming 1 per cent incidence of P.n. and OAD respectively
- j) Assuming 54 days off work on average at 55 ZAR per day in direct salary
- k) Assuming 320 ZAR per day for 54 days off work on average
(Medical costs supplied by a mine medical officer.)

The HSE model is able to estimate the total societal cost of occupational disease. Data for costs borne by the mining industry are relatively easy to obtain. Costs borne by society as a whole are more difficult to establish. Given the problems of extrapolating from a British economic and health and safety context to that of South Africa, a new method for evaluating societal costs was developed. In an attempt to cost that portion of mining-related occupational disease that is being borne by the state health services and the households of diseased ex-mineworkers, detailed interviews with members of the South African National Department of Health Tuberculosis Control Programme and the Medical Superintendent of St Barnabas Hospital, the rural hospital which serves Libode, were undertaken. In addition to the interviews with health workers, questionnaires were administered to those members of the Libode random sample study group who were found to be eligible for compensation (and to the next of kin of ex-mineworkers who had died). These interviews took place prior to the compensation payments being made. While it must be acknowledged that the data from the questionnaires are based on a small sample size (62), the results reveal a burden of disease being borne by households which would merit further investigation by use of a larger study group.

The majority of those eligible for compensation (60 per cent) reported being currently treated for tuberculosis, and they could produce their medication as evidence thereof. In South Africa, treatment for tuberculosis is free to the patient and the cost falls on the public sector medical services. Treatment according to Department of Health guidelines differs, depending on whether the patient is a new case or a re-treatment case (20 per cent of cases are re-

treatment cases). New cases are treated for six months. The first two months involve therapy with drugs that cost 38.6 ZAR per month. For the following four months, drugs that cost 65.6 ZAR in total, are taken. The total direct cost of new cases is 142.8 ZAR. Re-treatment cases are treated for two months with five drugs at 79.2 ZAR per month, for one month with four drugs which cost 42.4 ZAR and for five months with three drugs which cost 176 ZAR. The total direct cost of re-treatment cases is 376.8 ZAR.⁸ Hence, the cost of treating an average patient is $0.8 \times 142.8 + 0.2 \times 376.80 = 189.6$ ZAR. Statistics from the rural hospital which serves Libode indicate that 2505 people were treated for tuberculosis at the hospital between January 1996 and December 1996. Of these, 537 were treated as in-patients (324 of whom were adult males) and 1968 were treated as out-patients (923 of whom were adult males). Ninety per cent of adult males treated for tuberculosis at St Barnabas Hospital had a mining history. Fifty percent of those admitted as in-patients with tuberculosis spend two weeks in hospital and are then discharged into a programme which includes directly observed therapy (DOT) in the community. The DOT in the community is undertaken by community volunteers and is not a paid job (common participants are church leaders, traditional leaders and also shop-keepers). The remaining 50 per cent spend one month in hospital before being discharged.⁹ It is important to note that while the DOT is administered by volunteers, the volunteers are administered and supervised by trained health care workers who themselves add costs to the health system. Furthermore, it is thought that the drug purchase price represents only approximately five per cent of the cost of a tuberculosis control program.¹⁰

Only one study has attempted to determine attributable risk of mining as a cause of tuberculosis.¹¹ It was found that for patients at a large referral hospital in Mdantsane, Eastern Cape Province, South Africa, there was an odds ratio of 1.51 ($p \leq 0.05$). Hence the mining attributable risk of tuberculosis was 34 per cent. The data presented for the mining attributable risk of tuberculosis represent the best available information and have been used to calculate the cost of treating tuberculosis attributable to gold mining.

$$N \times P \times A = 1247 \times 0.9 \times 0.34 = 382 = C$$

where N is the number of men treated for tuberculosis in the hospital which serves Libode, P is the percentage of those treated who have a mining history and attending St. Barnabas Hospital and A is the attributable risk of mining.

$$C \times Q = 382 \times 189.6 = 72\,427$$

Where Q is the average cost of tuberculosis drugs.

Thus, we see that the state medical services spent at least 72 427 ZAR on drug costs in 1996 for tuberculosis that can be attributed to mining in Libode. The adjusted costs, taking account of the capital and recurrent annual costs of providing tuberculosis control for ex-mineworkers in Libode is thus estimated to be 1.45 MZAR.

In addition to the state medical expenditure, the data provided by the questionnaires indicated that prior to compensation, the average ex-mineworker in Libode with compensable pneumoconiosis spent an average of 780 ZAR per year on medicines to relieve the symptoms of lung disease (medicines were bought from chemists and traditional healers) and 156 ZAR on transport to medical facilities. Therefore, the average medically-related expenditure per person is 936 ZAR per annum.¹² Gold mine recruitment records are available for Libode for the period 1969 to 1980. These recruitment records show that roughly 12 000 mineworkers were recruited between 1969 and 1980 in Libode. Given the prevalence of radiological and compensable disease in Libode, we can estimate that there are between 2640 and 4440 ex-mineworkers in Libode who have radiological pneumoconiosis and 3120 with compensable disease. If we assume that 55 per cent are dead (as was the case for the Libode random sample) this leaves 1716 people living with compensable pneumoconiosis. Hence, we can estimate an annual personal medical expenditure of 160 6176 ZAR for ex-mineworkers with compensable disease in Libode. If the personal medical expenditure of men eligible for compensation is added to the state medical expenditure on disease that can be attributed to mining, the total expenditure in Libode is 3.056 MZAR.

Assuming that there are 1.4 million South African ex-mineworkers who worked between 1973 and 1997 (of whom 60 per cent are still alive), there are 840 000 living ex-mineworkers in South Africa. Thus, the annual cost of occupational lung disease health expenditure (both state and private) in ex-mineworkers that can be attributed to mining is 214 MZAR.

There are additional costs which cannot be established on the available information. These include the costs related to the time families devote to care giving; the cost of infection of family members by ex-mineworkers with tuberculosis attributable to mining; and the costs of missed opportunities that households bearing the costs of occupational lung disease have foregone. The above data illustrate that there are many costs of occupational lung disease which are being borne by the ex-mineworker with pneumoconiosis, his household, his

community and the public sector medical facilities rather than the mining industry. Part of the mining industry's tax funds the public health service however the industry's overall tax contribution has fallen dramatically since the late 1980's to just under two per cent of contributions to the fiscus.

Table 12.2 shows the internalised and externalised costs of occupational lung disease. While it is important to acknowledge the small sample size that gave rise to the data obtained from the questionnaires, the implications for the state health services and rural communities of the costs of occupational lung disease are clearly profound. It is also important to note that Table 12.2 does not include the unpaid liability of compensation which is not an annual figure.

Table 12.2 Application of the HSE model to South African gold mining industry at current prices for the 1996 workforce of 342 893 men and assuming 840,000 former mineworkers

Category	Category components	Annual Value MZAR
Costs of occupational disease internalised by the mining industry	Employer's contribution to compensation fund, employer's costs of medical surveillance, employer's costs of medical treatment for in-service workers, employer's costs relating to loss of output for men with occupational disease.	344
Costs externalised	Costs born by ex-mineworkers relating to purchase of medicines and transport to medical facilities and costs born by the state relating to treatment for tuberculosis attributable to mining.	214
Total		558

Note, as this is an annual cost, the table does not include the unpaid compensation liability.

The above data indicate that a large proportion of the costs of mining-related occupational lung disease are not being borne by the mining industry. Significant costs generated by the mining industry are being externalised. Eckhom 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."¹¹

The cost to the state medical facilities and the labour sending communities of occupational lung disease, represents an expense externalised by the South African mining industry. Mr B. 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", implying that these positions are tradeable.¹⁴ Mr Godsell's notion of a "past injustice" is not supported by the testimony presented to the 1994 Commission of Inquiry into Safety and Health in the Mining Industry that there is no evidence of a reduction in dust levels on South African gold mines over the past 30 years; which suggests that there has been no reduction in disease incidence.¹⁵ Contrasting the compensation for occupational disease against preservation of employment, is a position that fails to recognise that this is not only a past problem but also current reality. Furthermore, the view fails to recognise that the externalised costs of gold mining are far greater than the costs of compensation alone. If the gold mining industry does not accept liability for unpaid compensation and externalised costs, who will? Mr L. Boyd (Deputy Chairman, Anglo American Corporation), has said that South African government spending must be drastically reduced.¹⁶ Spending cuts are likely to include health care and social services provided for labour sending communities. The logical conclusion as regards approaching the matter of unpaid compensation and externalised costs in this way, is that the burden of occupational disease amongst ex-workers and labour sending communities should be written off as bad debt or treated as obsolete capital.

Externalising the costs of occupational lung disease is extremely damaging for individuals, households and communities in labour sending areas. In a context of low levels of education and high levels of dependency on physical labour as a source of employment even a relatively minor degree of disability can be a major impediment to future employment. Chambers argues:

"the body is the poor person's greatest and uninsured asset. If this asset is devalued or ruined, from being an asset it becomes a liability that has to be fed, clothed, housed and treated. A livelihood is destroyed and a household is made permanently poorer."¹⁷

It is inefficient for the country as a whole to take on the externalised costs of mining related-occupational lung disease. Internalising the costs of disease would almost certainly result in measures being taken to reduce dust levels, with a consequent reduction in disease incidence. Therefore, a reduction would follow in the disease related costs to society. It can be argued that redressing the unpaid compensation liability would result in distribution of income, by

egal entitlement, to one of the poorest sectors of the population, which would reduce societal inequalities.

12.4 Conclusion

It is important to note that the methodology used in this chapter is determined by the available information. In an industrialised country, it would not be considered good practice to extrapolate from a survey undertaken in only one district to the whole country. Unfortunately, as has been shown in previous chapters, there are no basic occupational health databases in South Africa and the research on which this thesis is based is represent the best available data. Priority should be given to carrying out more extensive studies in order to establish the true prevalence of occupational lung disease in ex-mineworkers, the number of such men still alive in South Africa, and the attributable risk of mining for the development of tuberculosis. There is also a need for more accurate denominator data on the number of living ex-mineworkers in the Southern African region.

On the basis of the available information, it has been shown that there is a high prevalence of previously undiagnosed, uncompensated pneumoconiosis in the labour sending area studied; and that there has been a failure to identify and compensate occupational disease. The internalised annual cost of occupational lung disease is estimated to be 344 MZAR, which represents four per cent of the gold mining male wage bill for 1996.¹⁸ The total annual cost of internalised and externalised gold mining-related occupational lung disease (excluding the unpaid compensation liability) is estimated to be 558 MZAR, which represents seven per cent of the 1996 wage bill (which was 8467 MZAR). South Africa's GDP in 1996 was 484 billion Rand of which gold mining contributed four per cent. The annual cost of gold mining related occupational lung disease excluding the unpaid compensation liability represents 0.12 per cent of South Africa's 1996 GDP and including the unpaid compensation liability represents 1.98 per cent of South Africa's 1996 GDP. The annual cost of gold mining-related occupational lung disease, excluding the unpaid compensation liability, represents 3 per cent of gold mining's contribution to GDP. If the unpaid compensation liability is included, this figure rises to 49.4 per cent of gold mining's contribution to GDP in 1996.

The data presented above have demonstrated a high cost of disease in the South African gold mining industry and show that there is a need to examine the degree to which the incidence and prevalence of disease could be brought down through dust control and changes in

legal entitlement, to one of the poorest sectors of the population, which would reduce societal inequalities.

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The data presented above have demonstrated a high cost of disease in the South African gold mining industry and show that there is a need to examine the degree to which the incidence and prevalence of disease could be brought down through dust control and changes in

working practices. The data above have also provided an indication of a previously uncoded cost of production. The question remains as to who should bear the costs of production. It is easy to argue that a modern mining industry must assume the full costs of occupational disease created by current practices. The complexity lies in how to deal with the historical legacy of unpaid compensation. In the final chapter, the implications of forcing mining companies to pay for past malpractice out of current income and will assess the extent to which this might force the closure of mines which having distributed profits to shareholders are not now in a position to pay.

¹ Nash, J. *We eat the mine and the mine eats us*. New York: Columbia University Press, 1979.

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⁶ Andreoni D. *The costs of occupational accidents and diseases*. Geneva: International Labour Office, 1986:12.

⁷ Davies NV, Teasdale P. *The cost to the British economy of work accidents and work-related ill health*. London: Health and Safety Executive Publication, 1994.

⁸ Personal communication, Dr Harry Hauseler, National Tuberculosis Programme, Dept. Health. 1997.

⁹ Personal communication, Dr Nava St Barnabas Hospital, 1997.

¹⁰ Dick J, Henchle S. *A cost analysis of the tuberculosis control programme in Elsies River, Cape Town*. *The Southern African Journal of Public Health* 1988;88:380-382.

¹¹ Hessel P, Sluis-Cremer GK. *Protocol for the investigation of health effects of gold mining exposures among former miners in the republic of Transkei*. Epidemiology Research Unit Working Paper 11 1986.

¹² Trapido A. *Results of a questionnaire relating to personal spending on occupational disease medication by ex-gold mineworkers*. In preparation.

¹³ Eckholm E. *Who pays for production?* In: Eckholm E. editor. *The picture of health, environmental sources of disease*. New York: Norton, 1977:154.

¹⁴ Robins D. *New study shows high rate of illness among ex-mineworkers*. *The Argus*, 1996 April 27.

¹⁵ Department of Mineral and Energy. *Report of the commission of inquiry into safety and health in the mining industry*. Leon RN, chairperson. Pretoria: Department of Mineral and Energy, 1995.

¹⁶ Von Holdt C. *Anglo American's Leslie Boyd (Deputy Chairman of Anglo American Corporation and Chairman of Anglo American Industrial Corporation) speaks bluntly on unions, wages and investment*. *South African Labour Bulletin* 1996;18:22-29.

¹⁷Chambers R. Vulnerability, coping and policy. *Institute of Development Studies Bulletin* 1989; 20:1-8.

¹⁸ Department of Minerals and Energy. South African mineral industry review 1996-97. Johannesburg: Minerals Bureau, Department of Minerals and Energy, 1998.

CHAPTER 13

Increasing the ODMWA Dust Levy and its Impact on the Viability of the Mining Industry

13.1 Introduction

Previous chapters have shown that there is a large unpaid compensation liability owing to former gold mineworkers under the ODMWA. It has been demonstrated that the occupational lung disease burden in former gold mineworkers has been externalised away from mining employers and much of the cost is being borne by state health services and rural households. This is clearly an unacceptable situation in that by externalising disease costs, the mining industry violates the important ecological and economic principle that the polluter should pay. A model was set out in chapter eleven which estimated the time period necessary to make an ODMWA medical benefit examination available to all living ex-gold mineworkers employed during the period 1973-1997. It was shown that it is possible to draw up a schedule to examine all living former gold mineworkers in eleven years based on explicit assumptions summarised in table 11.2. A discussion as to the differences between the theoretical liability and the actual liability in respect of cases that can be reached before the patient dies, revealed that the full estimated liability of 9 006 MZAR is considerably larger than the feasible estimated liability of 2139 MZAR when mortality is factored in.

The difference between the feasible estimate and the full liability notwithstanding, there is still a need to increase the ODMWA dust levy in order to make provision for payment of the increased claims for compensation. There have been numerous comments cited in this thesis from senior mining employers which suggest that a rise in the dust levy may cause the economic collapse of the gold mining industry. Compensation payments to former mineworkers have been said to threaten the jobs of current workers. This chapter will examine the impact on the economic viability of the gold mining industry of an increase in the amount paid into the ODMWA dust levy. A detailed financial analysis of the gold mining industry will not be undertaken, instead the impact of raising the ODMWA dust levy will be assessed in terms of the effect it would have on the gold mining pay limit. This methodology eliminates variance between mining company financial performance and simplifies the industry into a single homogenous mine. This discussion is in constant rands with no

adjustment made for inflation or possible changes in the gold price as it should be noted that currency depreciation trends tend to offset the effects of inflation on gold mine costs.

13.2 Impact on the gold ore resource base

It is estimated that the Witwatersrand has an underground gold resource base of approximately 47 000 tons. Of this some 20 000 tons are below 4000 metres underground and are not extractable under current technological conditions.¹ The amount of gold that can be extracted economically from this resource base is dependent on the cost of extraction, referred to as working costs, and the gold price. A movement of either of these costs alters the proportion of the ore body that can be mined economically. If working costs rise without a concomitant rise in the price of gold, the pay limit will rise and the proportion of the ore body can be mined economically will fall.

The average cut-off grade, below which it is uneconomic to extract the gold, is determined by the Rand gold price per gram and the average working costs per ton of ore milled. In 1997, the average Rand price of gold per gram was R48, 98 and the average working cost per ton of ore milled was R228,01, giving an average cut-off grade for extraction of gold on an economic basis of 4.66 grams per ton. This means that the South African gold mining industry had to mine ore of an average grade of at least 4.66 grams per ton to break even with working costs. Applying this cut-off grade and using 1997 prices and costs of extraction, Baxter , in a document produced by the Chamber of Mines for the Gold Crisis Committee, estimates that approximately 14 310 of the 20 000 tons can be recovered and are economic to mine. Assuming that no new mines open and that current rates of production remain the same, 14 310 tons will last for approximately 30 years.²

In this same document, Baxter sets out the different cut-off grades at different working costs. He argues that large amounts of gold-bearing ore are not being mined because taxes and levies raise the cost of extraction beyond that which is economic. Any levy, including the ODMWA compensation levy, will have implications for the amount of gold that can be recovered from underground on an economic basis. Baxter states that if the gold mining industry could be exempt from having to pay levies and taxes, working costs could be reduced by three per cent and the average cut-off grade would fall to 4.5 grams per ton. He argues that this would allow the mining industry to contribute more to South Africa's economic development, growth and stability. Baxter argues that: