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HEALTH CARE WORKERS' KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING PREVENTION OF SMOKING IN GOLD MINE WORKERS

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A RESEARCH REPORT SUBMITTED TO

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OF

MASTER OF PUBLIC HEALTH

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Declaration

I, Dr Vanessa Ganesegerie Govender, declare that this research report is my own work. It is being submitted for the degree of Master of Public Health in the School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

……..
Dr VG Govender

This 25th day of April 2007

The author dedicates this work to her beloved family

Dad – for giving me my roots and my wings,
Mum – for being the wind beneath those wings
Pat – for your endless love
My Angels - Sansara, Talya and Pranav
For your sacrifices and unconditional love
And
Swami for your Divinity
I am humbly grateful

Presentations and publications

The presentation "*The burden of smoking in South African gold mine workers*' has been delivered by the researcher at several conferences both locally and internationally, to the South African Parliament as well as professional bodies and the workplace.

1. Parliamentary Health Portfolio Committee, public hearings on the Tobacco Products Control Amendment Bill (2006), 23 January 2007.
2. South Deep Gold Mine, Manager's meeting, Westonaria, 11 January 2007. Oral presentation.
3. National Institute of Occupational Health spirometry seminar, Johannesburg, 18 October 2006. Oral presentation.
4. Featured in 'Heartbeat' a quarterly newsletter for the employees of Gold Fields. "Our doctor in a million". Issue number 7, July to September Quarter 2006
5. 28th International Congress on Occupational Health (ICOH), Milan, Italy, 11-16 June 2006. Poster presentation.
6. Public Health Association of South Africa conference, Johannesburg, 17 May 2006. Poster presentation.
7. Mines Ventilation Society of South Africa Annual General Meeting, Westonaria, 12 May 2006. Oral presentation
8. Driefontein Gold Mine, a division of Gold Fields International Mining Services Pty (Ltd), Executive Committee, 26 October 2005. Oral presentation
9. Gold Fields Board of Directors, 1 September 2005. Oral presentation
10. Gold Fields Occupational Health and Safety Conference. *How do we influence the bottom line*? Westonaria, 31 August 2005. Oral presentation. Won "Best Presentation" award.

The presentation has won an award for "Best presentation" at Gold Fields Occupational Health and Safety Conference in 2005 and has featured in the quarterly newsletter 'Heartbeat' for the employees of Gold Fields Health.

Abstract

Background: The high prevalence of smoking on the mines contributes significantly to the public health burden due to exposure to crystalline silica dust and high HIV and TB prevalence rates. Progressive anti-tobacco legislation that informs workplace smoking policies is in existence but there are no formal smoking interventions to achieve the objectives of such policies and to facilitate health promotion. Health care workers, in particular have a vital role to play in this regard.

Objectives: The objectives of this research study were to determine the knowledge, attitudes and practices of HCWs regarding prevention of smoking in gold mine workers and to use this information to propose a framework for a smoking intervention programme for the mines.

Methods: This was a cross-sectional descriptive knowledge, attitudes and practice (KAP) study. Data were obtained from 69 HCWs using self-administered questionnaires, from 161 occupational lung disease (OLD) and 30 medical ward admission record reviews, and from 4 informal discussions.

Results: While knowledge and attitudes about smoking was good overall and 84.1% of HCWs reported that they would routinely ask smoking status and document it, this was not done in practice. An overwhelming majority of HCWs are aware that smoking is harmful to one's health (98.6%); is harmful to mine workers' health (97.1%), and predisposes them to acquiring lung diseases (95.7%). Half (56.7%) of the nurses, but no doctors documented smoking history on admission and poor follow up of this advice (38.5%) is an area of concern. HCWs identified a need for support structures such as workplace and community programmes that include education, training and awareness campaigns.

Conclusion: Overall, HCWS are responsive to workplace smoking interventions: they are knowledgeable, and show insight and have positive attitudes towards smoking interventions, but a more enabling environment is required to establish good workplace practices. To this end a "Proposed framework for smoking interventions on the mines, incorporating the HCW programme" has been developed and partially implemented. Awareness of this study and its preliminary findings has already demonstrated a paradigm shift in thinking about tobacco on the gold mines.

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A host of friends, family, colleagues, teachers and spiritual guides who have walked beside me on this journey and most importantly, all my patients over the years, who have been my “teachers” and who have inspired me to think beyond the bedside,

I salute you all.

List of acronyms

AIDS	Auto-Immune Deficiency Syndrome
COAD	Chronic Obstructive Airways Disease
DME	Department of Minerals and Energy
FCTC	Framework Convention for Tobacco Control
GFBLA	Gold Fields Business and Leadership Academy
GFHS	Gold Fields Health Services
GFHS (WW)	Gold Fields Health Services West Wits
GP	General Practitioner
HAART	Highly Active Anti-Retroviral Treatment
HAVS	Hand Arm Vibration Syndrome
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
HR	Human Resources
KAP	Knowledge, Attitudes and Practices
LPWH	Leslie Williams Private Hospital
MBOD	Medical Bureau for Occupational Diseases
MHSC	Mine Health and Safety Council
NA	Not Applicable
NCAS	National Council Against Smoking
NRT	Nicotine Replacement Therapy
ODMWA	Occupational Diseases in Mines and Works Act
OHC	Occupational Health Centre
OLD	Occupational Lung Diseases
OMP	Occupational Medical Practitioner
SA	South Africa
TB	Tuberculosis
TEBA	The Employment Bureau of Africa
USA	United States of America
WHO	World Health Organisation

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CHAPTER 1: INTRODUCTION AND BACKGROUND

The high prevalence of smoking on the mines contributes significantly to the existing health burden due to exposure to crystalline silica dust, human immunodeficiency virus (HIV) infection and tuberculosis (TB).

Gold mine workers are exposed to crystalline silica dust, and silica dust related diseases present a significant challenge to the mines. The mines are responsible for controlling dust levels and contribute a levy towards this to compensate workers afflicted with resulting occupational diseases. Smoking is associated with many of these diseases.

The South African government has committed itself to the ideals of the World Health Organisation's Framework Convention on Tobacco Control[a] (WHO FCTC)[1]. Nationally, there is progressive legislation coupled with a well established anti-smoking campaign. Like most workplaces, Gold Fields has a formal "Smoking in the workplace" policy (Appendix 1) developed to comply with legislation. However, again like most workplaces, there is no formal smoking intervention programme to assist employers and employees to achieve the aims outlined in the policy, such as providing advice and support to workers who decide to give up smoking. Health care workers (HCWs) have a critical role to play in this regard and it is envisaged that the results of this research will inform policy on utilising health professionals as the primary means of smoking intervention on the mines.

1.1 Global burden of smoking

Tobacco is the second major cause of death in the world[2] and cigarette smoking is the most prevalent modifiable risk factor for increased morbidity and mortality in the world. The World Health Organisation (WHO) estimates that there are currently 1.3 billion smokers in the world[2]. Half of lifelong smokers who start smoking in adolescence and continue throughout their lives will be killed by tobacco, and half of those will be in their middle age when this happens[3]. Tobacco kills about 5 million people per year and unabated, will cause some 10 million deaths each year by the year 2020; 70% of these will be in developing countries[2].

[a] SA is co-signatory of more than a hundred countries worldwide of the WHO's Framework Convention on Tobacco Control (FCTC). The FCTC is an evidence-based international treaty which covers all measures aimed at tobacco control.

1.2 Burden of smoking in South Africa

Since 1994 South Africa (SA) has passed progressive tobacco control that protects the health of citizens. The Tobacco Products Control Act of 1993[4], contributed to a decrease of smoking prevalence in the general population, from 32.6% in 1993 to 28.5% in 1998[5]. In 1999, the Act was amended by the Tobacco Products Control Amendment Act[6], contributing to a further decrease in the prevalence, to the current estimate of 22% (Personal communication, P Ucko, National Council against Smoking, 2006).

Public hearings on the Tobacco Products Control Amendment Bill (2006)[7] are scheduled to be held in Parliament in early 2007. The purpose of the Bill is to ensure that young people don't start smoking; to protect people from tobacco smoke pollution; to help smokers quit, and to reduce the risks for those who continue to smoke. The main changes contained in the proposed Bill are to amend the current Act so as to strengthen the section which regulates smoking in public places; to increase fines for breaking the law; and to control the ingredients and emissions from tobacco products and to establish manufacturing standards. The Bill also helps bring SA tobacco legislation in line with WHO recommendations in the Framework Convention on Tobacco Control (FCTC)[1,8].

In SA, tobacco has been ranked third (after unsafe sex and hypertension), in terms of cause of mortality out of seventeen risk factors evaluated[9]. By 1990, 25 000 tobacco-related deaths were reported annually[10], however in 2000, smoking caused approximately 40 000 deaths[9]. The direct cost of hospitalisation and outpatient treatment for smoking-related diseases in the public sector is approximately R1.5 billion per year[10].

Despite the government being proactive with bold legislation contributing to declining smoking prevalence rates, this must not lead to a false sense of security: tobacco control remains an important public health priority in SA.

1.3 Burden of smoking in South African mines

People employed in labour intensive industries are more likely to smoke than people employed in 'professional, service and people-oriented' industries[5]. In 2003, a Mine Health and Safety Council (MHSC) project on smoking in the platinum mining industry showed that the mine workers' overall smoking prevalence was 44%[11]. Cheyip also showed an overall decrease in the smoking prevalence in this industry over the five-year study period (1998 to 2002), in keeping with the national trend. However, unpublished data suggest that the South African gold mining industry may have smoking prevalence rates as high as 60% (Personal communication, DA Scott, Gold Fields, 2006).

South African gold mine dust has very high crystalline silica content which is hazardous to workers' health. Smoking workers thus suffer a double insult to their lungs,

as several silica dust related diseases are also intimately associated with smoking. These occupational lung diseases are silicosis[12], chronic obstructive airways disease (COAD)[13], tuberculosis (TB)[14] and lung cancer[15] and all are compensable under the Occupational Diseases in Mines and Works Act (ODMWA) of 1973[16].

The burden of smoking on the mines extends beyond the respiratory system and smoking is also associated with hearing loss[17] and hand arm vibration syndrome (HAVS)[18].

Smoking is prohibited on all underground operations as a safety measure and constitutes a summary dismissible offence (Appendix 1). The challenge remains to enforce the existing restriction and further extend it to all surface operations and public areas on the mines.

1.4 Burden of smoking on employers

In 2002, Osinubi reported that in the United States of America (USA), smokers have more hospital admissions, take longer to recover from illness, and have higher out-patient health care costs than non-smokers[17]. Smoking presents a huge economic burden to society as a whole, accounting for up to 15% of total health care in developed countries. “It is estimated that tobacco use costs the American economy well in excess of 100 billion dollars per year in both productivity and health care costs”.

In 1998, in SA, estimates of economic costs of tobacco in terms of lost productivity due to premature deaths and hospitalisation exceeded R2.5 billion[10]. However, these estimates do not take into account the behaviour patterns of smokers that reduce productivity while at work but do not result in absenteeism. At work, smokers take, on average, three smoking breaks (lighting up, puffing, buying, and borrowing) lasting 13 minutes each, i.e. 39 minutes lost productivity per day, equivalent to 18 days per year. In the USA, these smoking breaks are estimated to have cost Michigan employers approximately $1.7 billion per year[19].

More recently in 2006, it has been demonstrated that current smokers miss more days at work and experience more unproductive time at work compared with former smokers or non-smokers[20], but as far back as 1979, absenteeism rates for smokers were estimated to be approximately 50% higher than for non-smokers[21].The average annual cost for lost productivity for non-smokers was $2 623 per year compared with $3 246 per year for former smokers and $ 4 430 per year for current smokers[20].

In 1996, in SA the total direct costs of occupational lung disease in the gold mining industry were estimated at R343 million[22]. In 2002, amended legislation section 36(a) of the Occupational Diseases in Mines and Works Amendment Act[23] stipulated that through the compensation levy, mine employers are liable for the medical costs of these diseases

from the commencement of disease, for life. This is a huge, as yet unfunded liability for the mining industry. A smoking intervention programme may contribute to the reduction in these levies and will be overall beneficial to workers' health.

Adverse health and productivity outcomes associated with tobacco use have a direct impact on employers, who often bear a substantial portion of these medical and compensation costs, and on employees who suffer from these diseases.

1.5 Occupational lung disease and smoking in the gold mining industry

Occupational lung diseases (OLD) such as silicosis, COAD, TB and lung cancer are compensable under ODMWA as they are attributable to exposure to high levels of free crystalline silica[16]. Compensation is awarded regardless of smoking history. With regards to silica dust exposure, the mines have a legal obligation, under section 11 of the Mine, Health and Safety Act (MHSA)[24] of 1996, to "take measures to assess the risk and control it". Once a significant risk has been identified, medical surveillance examinations according to sections 13 (1)(2)(3) and 8 (a) and (b), 15 (2) (a) and (b) of the MHSA, become a legal imperative, to detect early OLD. However, the evidence shows that dust control alone is inadequate for the prevention of these OLD.

Figure 1.1 shows that OLD such as TB, silicosis and COAD account for 86% of the occupational diseases reported on the mines[25]. In 2004, Sitas *et al*. showed that smoking significantly increased the risk for deaths from TB and COAD, as well as lung cancer[26].

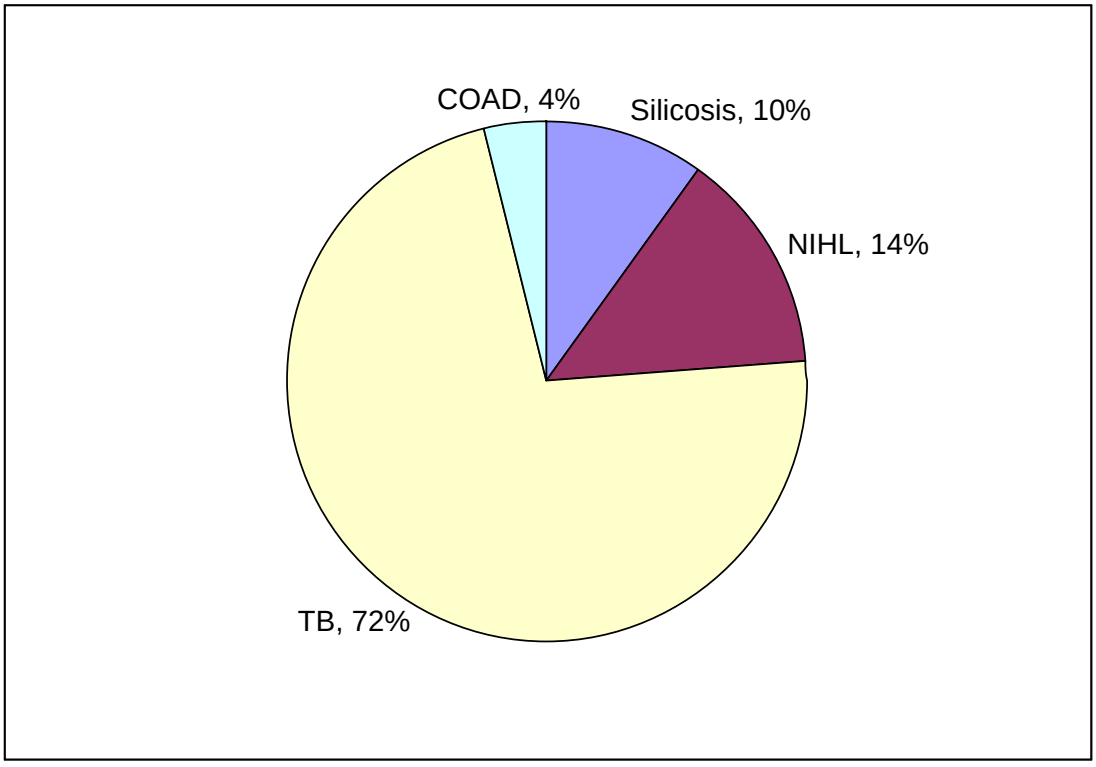


Figure 1.1 Proportions of the most common occupational diseases at Gold Fields[25]

1.5.1 Tuberculosis

The current TB incidence rates at Gold Fields is 41 new cases / 1 000 employees[27] and has remained constant for several years. This is largely reflective of the TB trends throughout the gold mining industry. Figure 1.1 shows that TB accounts for 72% of the reported occupational diseases at Gold Fields, and as such, presents a significant challenge to the company.

Both silica dust exposure and silicosis are life long risk factors for the development of TB[14,28]. Overall, in workers with established silicosis, the risk for TB is up to three fold higher than in non-silicotics[28]. This risk increases with increasing severity of radiological silicosis and cumulative exposure to silica dust, and persists long after exposure has ceased[14,28].

In 1998, Hnizdo and Murray showed that tobacco use, in addition to silica dust exposure, is a risk factor for the development of TB[14]. Smoking increases the severity of TB infection[29], incidence, progression and death rates[30] and there is a strong dose-response relationship between tobacco use and TB[31]. In 1998, Sitas *et al.* estimated that 20% of TB deaths in SA are due to smoking[26]. A recent study in India showed that a high proportion (50%) of TB deaths in males is attributable to smoking[32]. Thus, individuals who have, or who are at risk of having, TB fare worse if they smoke.

1.5.2 Chronic Obstructive Airways Disease

Figure 1.1 shows that COAD accounts for 4% of the 4 most common occupational diseases reported at Gold Fields[25]. Since silica dust is a risk factor for COAD, gold mine workers undergo routine spirometry as part of the medical surveillance examinations to detect early deterioration in lung functions or airflow obstruction.

In 2003, Hnizdo and Vallyathan showed that chronic low levels of silica dust can lead to airflow obstruction, even in the absence of established silicosis[13]. However, as far back as the early 90's, Hnizdo looked at white South African gold mine workers and concluded that smoking alone was a greater risk factor for serious disability from COAD than was silica dust alone[33]. Figure 1.2 shows that the estimated attributable fraction for severe airflow obstruction was 8% for dust alone; 42% for smoking; and 40% for silica dust and smoking combined. She estimated that the elimination of smoking alone would prevent 82% of cases of severe airflow limitation while the elimination of silica dust alone would prevent only 48% of cases. Hnizdo concluded that decreased tobacco consumption would, in most cases, prevent serious lung function impairment and the associated premature deaths in gold mine workers.

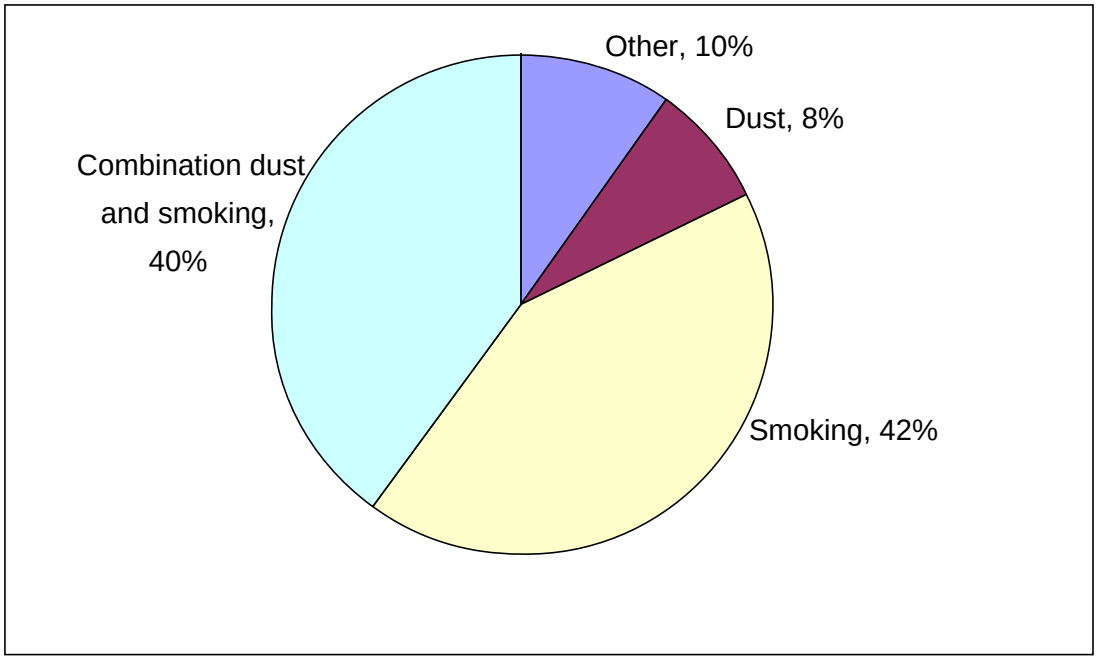


Figure 1.2 Attributable fractions for severe airflow limitation[33]

1.5.3 Silicosis

Figure 1.1 shows that silicosis accounts for 10% of the 4 most common occupational diseases reported at Gold Fields[25].

In 2003, Hessel evaluated the relationship between silicosis and smoking, and reported a suggestive association[12]. Smoking was positively associated with silicosis in three out of thirteen studies. However, it was unclear if this indicated that smoking predisposes to developing silicosis.

1.5.4 Lung cancer

Tobacco smoking is, globally, the single most important cause of lung cancer. However, in the gold mining industry, silica dust, diesel particulate matter and radon can also cause lung cancer[34]. Smoking in these mine workers can increase this risk. There is sufficient evidence to support an association between silicosis and lung cancer. However there is still debate as to whether silica dust poses a risk for lung cancer in the absence of established silicosis[35].

1.5.5 Occupational asthma

Not previously diagnosed in this setting, cases of work-aggravated asthma (hereinafter referred to as occupational asthma) have recently been identified at an incidence of less

than 0.05%[36]. The precise aetiology of the asthma remains unknown but this condition is probably exacerbated by a combination of environmental exposures, as well as smoking.

1.6 Smoking and HIV-AIDS

Recent evidence suggests that 70% to 80% of HIV infected patients smoke[37] and there is widespread acceptance that cigarette smoking increases the risk of acquiring infections, especially pulmonary infections in both HIV positive and negative individuals. The mechanisms are possibly related to actual structural modification in the lungs as well as derangements in both humoral and cellular immunity.

SA has one of the highest HIV prevalence rates in the world, with the mining population considered to be at particularly high risk. At Gold Fields the current estimate for the West Witwatersrand region is 30%[38] which is consistent with other high risk populations such as the national antenatal clinic prevalence rate of 30.5%[39]. The mining workforce comprises mainly black males but a prevalence rate for this population group is not currently available. The national prevalence for males is 8.2% and that for Africans is 13.3%[39]. Thus, the estimate for black males is probably within this range, much lower than the prevalence on the mines. There is a window of opportunity to embark on other parallel health promotion initiatives such as smoking cessation, as the anti-retroviral treatment programmes which have been faced with challenges, are now well established both nationally and on the mines.

In 2006, Furber *et al*. conducted a systematic review, and of the six studies examined, five suggested that smoking tobacco is an independent risk factor for HIV seroconversion after adjusting for confounding factors[40]. They also showed that smoking does not appear to be related to the progression to AIDS, but this may be influenced by treatment with antiretroviral drugs and they suggested that further research is required to fully understand the effect of smoking since the introduction of HAART.

In 2005, Patel *et al*. showed that tobacco smoking is an independent risk factor for non-AIDS –related mortality in patients who have HIV, even in patients on Highly Active Anti-Retroviral Treatment (HAART)[37]. Smokers on HAART, have more inter-current, non-AIDS defining illnesses than non-smokers. Furthermore dyslipidaemia, as an important side effect of the protease inhibitors, predisposes these patients to the development of cardiovascular diseases.

There are increased health risks associated with people who smoke and have HIV infection[37,41]. It is of extreme public health concern that a smoking, HIV positive, silica dust exposed worker will have a worse health outcome even if on HAART, than a worker with no risk factors. Furthermore, worldwide TB is a leading cause of morbidity and mortality in people with HIV. Thus tobacco control and smoking interventions, being important public

health measures, may also contribute to the effectiveness of both HIV/AIDS and TB control programmes.

Health risks associated with people who smoke and have HIV infection [37, 41]:

- Increased risk of HIV-associated pulmonary infections particularly tuberculosis, *Pneumocystis Carinii* and community-acquired pneumonia
- Increased risk of accelerated form of lung damage consistent with an emphysema-like process
- Increased risk of HIV-associated oropharyngeal lesions such as hairy leukoplakia and candida
- Higher incidence of AIDS-defining and non-AIDS-defining malignancies
- As an established risk factor for atherosclerosis, it has been associated with coronary events in patients receiving protease inhibitor therapy

The WHO's Tobacco Free Initiative states that there are only two causes of death that are large and growing worldwide: HIV and tobacco[42]. Although the mining industry has responded to HIV, the response to tobacco is only beginning to emerge. The challenge is for all HIV programmes to amend their ABC strategy as recommended by the National Council against Smoking (NCAS)[43] in a recent press release, to include tobacco control:

A abstain
B be faithful
C condomise, and
D don't smoke

1.7 Smoking in the social context

Most (88%) of the workforce at Gold Fields is comprised of unskilled labour; 60% are migrant labourers (Personal communication, W Greeff, Gold Fields, 2006). A large proportion comes from socioeconomically disadvantaged environments. Despite the commendable efforts of mining management to enhance the living and working conditions on the mines, this environment remains a particularly vulnerable one with dysfunctional living conditions such as single sex hostels; lack of family support structures and recreational facilities confined mainly to the hostels. This scenario, coupled with the physically and psychologically challenging work environment, may be a reason why these workers smoke or take up smoking. In 2004, Cheyip showed that white mine workers of all ages tend to smoke more heavily than black mine workers, while 5% blacks and 4% whites took up smoking during employment[11].

Studies across the world show that it is the poorest people who tend to smoke more, in both developed and developing countries. This is probably because they are less aware of the risks, or they may use nicotine as self-medication for some ailments which they falsely believe that tobacco will cure[44, 45]. Also, there are sufficient data to show that people with lower education and literacy rates, and who are poor, are more susceptible to the harmful health effects of smoking[44]. In low-income countries poor families allocate a large part of the household expenditure to tobacco, as much as 10% of household expenditure, sacrificing basic needs such as food, education and healthcare[45].

In 2004, the WHO launched World No Tobacco Day[45] with the slogan, "Tobacco and Poverty: a vicious circle", emphasising the economic burden of tobacco use on families, communities, employers and developing countries. South African gold mines thus have a particularly "vicious circle" with the burden of poverty, tobacco, HIV/AIDS, and crystalline silica dust all impacting heavily on health.

1.8 The role of HCWs in smoking interventions

The government has a constitutional and moral imperative to develop and institute appropriate legislation to control the smoking epidemic. However, it is the public and particularly health professionals, who have a moral, ethical, professional and social obligation to apply public health measures to promote compliance with legislation by contributing to the development and implementation of smoking intervention programmes.

There are many basic smoking interventions that can be targeted at both smokers and non-smokers and which can protect non-smokers from second-hand smoke. These include increasing the price of tobacco by increasing taxes; banning smoking in public places; creating and disseminating effective counter marketing messages; and banning tobacco advertising. However implementing smoking intervention programmes is the one that HCWs can be most instrumental in assisting with.

In 2005 the WHO's theme was 'Health Professionals against Tobacco' focussing on the critical role of HCWs in assisting patients with tobacco cessation[47]. Prior to this, in 2004, the *Code of Practice on Tobacco Control for Health Professional Organisations* was developed[48]. It outlined, in particular, that health professionals should routinely ask patients and clients about tobacco consumption, and exposure to tobacco smoke. Using evidence-based approaches and best practices, health professionals must give advice on how to quit smoking and ensure appropriate follow-up.

1.8.1 Physicians

Advice from a general practitioner (GP) is effective and extremely worthwhile from a public health perspective: it is estimated that 50% of smokers will stop smoking if advised by a

GP and if supported by established protocols, including the use of nicotine replacement therapy[49]. The estimated savings are $700 per life year gained.

In 2005, in the Cochrane review on 'Physician advice for smoking cessation', Lancaster and Stead concluded that brief simple advice about quitting smoking increases the likelihood that a smoker will successfully quit and remain a non-smoker 12 months later compared to no advice[50]. More intensive advice may result in higher rates of quitting. Studies have also shown that the systematic attention to smokers not only encourages cessation, but the relapse rate may be much lower than the natural rate[51]. In 2005, Ashrafjit *et al*. showed that physician advice, in addition to treatment, goes a long way in making people quit smoking[52]. Thus, the physician, as part of the team of HCWs, has an important role to play in smoking interventions at every consultation.

1.8.2 Nurses

In the Cochrane review 'Nursing interventions for smoking cessation', Rice and Stead concluded that nurses, being the largest component of the healthcare workforce, must be involved in smoking interventions in all levels of health care[53]. As such, advice and support from nursing staff could increase people's successes in quitting smoking. In the in-patient setting, a study done by McCabe *et al*. (2005) showed that smoking intervention programmes can be implemented without additional staff[54]. A study by Haddock and Burrows (1997), evaluating a nurse-implemented smoking intervention programme in a surgical pre-admission clinic, reported that the approach of the nurse, as well as a leaflet, was most helpful[55]. However, the latter was particularly useful for patients who had already decided to stop.

The workplace can be an effective setting for people to stop smoking. Targeting HCWs on the mines is appropriate as mine workers regularly come into contact with HCWs, especially nursing staff. Occupational health nurses in particular perform spirometry routinely on mine workers, and poor lung functions may be an early marker of the adverse health effects of smoking, in addition to silica dust, in this setting. Nurses, thus, can use the medical information available to them and play a pivotal role in smoking interventions.

1.8.3 Other medical interventions

In 2006, a Cochrane review reported that proven interventions like group therapy, individual counselling and nicotine replacement therapy increases cessation in comparison to no treatment or minimal intervention controls at the workplace[56]. They are equally effective when compared to each other, but enhanced follow-up of cases is a key element for success[57].

Productivity is of great importance on the mines and there is great emphasis on managing ill-health optimally and expediting the return of workers to the workplace. Most of these efforts are therapeutic, with little or no emphasis on health promotion aspects. A window of opportunity exists, for health professionals to address the scourge of OLD in addition to the other public health priorities, like HIV and TB more holistically.

1.9 Motivation for the study

The evidence shows that there is a host of occupational health, public health and social issues that threaten the health and productivity of the mining workforce. Smoking impacts heavily on OLD and subsequently on the health status of gold mine workers. Smoking also affects the health of HIV positive individuals, including those on HAART.

HCWs can play an important role in smoking intervention programmes in this setting as these employees come into regular contact with HCWs. The health services, occupational, primary and secondary, are well situated and resourced to facilitate such intervention. However, before such a programme is developed, it would be prudent to establish the current knowledge, attitudes and practices of HCWs regarding prevention of smoking amongst gold mine workers. Since there is a paucity of information in this field of study, it is envisaged that the results of this study will be instrumental in guiding the design and implementation of best practice smoking interventions on the gold mines.

1.10 Study objectives

- To determine the knowledge, attitudes and practices of nurses at Gold Fields Health Services (GFHS) working in primary health care, TB, wellness and occupational health clinics, about prevention of smoking in mine workers
- To determine the knowledge, attitudes and practices of all doctors at GFHS, about prevention of smoking in gold mine workers
- To determine what strategies these HCWs consider might be effective in a smoking intervention programme
- To use this information to design a smoking intervention programme that could be integrated into existing health care services

CHAPTER 2: MATERIAL AND METHODS

2.1 Study Design

This was a cross-sectional descriptive knowledge, attitudes and practice (KAP) study using self-administered questionnaires to determine knowledge, attitudes and workplace practices, of HCWs regarding smoking intervention in gold mine workers. Retrospective record reviews of cases of diagnosed OLD and occupational asthma were used to determine the actual workplace practice, as a more objective comparison with reported practice. Informal discussions with HCWs supplemented the results obtained.

2.2 Study Setting

Gold Fields is one of the largest gold mining houses in the world, with South African operations in Gauteng, Northern Province and the Free State. Both the Kloof and Driefontein gold mines comprise the West Witwatersrand (West Wits) region. The study setting was Gold Fields Health Services West Wits region, GFHS (WW) and the occupational health centres (OHCs), West Wits.

GFHS (WW) provides a comprehensive health service, comprising, primary and secondary health care, to approximately 35 000 employees from the West Witwatersrand operations. The majority of employees utilise GFHS (WW) when ill or injured. The mine pays a capitation fee for these workers; hence medical care is free for the majority of workers. Employees on medical aid can utilise GFHS (WW) or other preferred providers in the region.

The Kloof and Driefontein medical stations provide a 24 hour primary health service. Employees with medical complaints would report at the medical station and are referred to the hospital for diagnosis and further management, where necessary. More comprehensive medical care is provided at the hospital – Leslie Williams Private Hospital (LPWH), which is a 363 bed facility. All medical and surgical out-patients, wellness, HAART and TB clinics are situated at the hospital. A total of 329 400 out-patient and clinic visits were recorded for the 2006 financial year[b,38] while 226 442 primary health examinations were conducted between 26 September 2005 to 25 September 2006[58].This clearly demonstrates that employees regularly utilise these services, often several times per year.

Medical surveillance examinations are performed at the OHCs on pre-employment, annually thereafter, and on termination. In addition, fitness to work

[b] Financial year is the period 1 July of one year to 30 June of the following year, while calendar year is January to December of the same year

examinations are regularly performed at these centres. On the West Wits employees would utilise two occupational health facilities namely, Kloof and Driefontein OHCs for this purpose. A total of 91 534 examinations were conducted in the 2006 calendar year [c,59] once again demonstrating that employees visit these facilities more than once per year.

Both the occupational health and primary health clinics are situated on-site at the mines. They are well resourced with appropriate technology and staffing. Capacity issues can be easily optimised to incorporate smoking intervention programmes. Such programmes at the workplace can add value by bringing health promotion to where people live and work.

2.3 Study population

The study populations were HCWs, cases of OLD submitted for compensation and medical ward admission records.

2.3.1 Health Care Workers

This study population comprised all nurses (n=175) with tertiary qualifications (either degree/diploma/certificate), working in primary health, TB, wellness, medical out-patient clinics and wards, who were employed in November 2005. A sample (n=42; 24%) of nurses from these clinics were randomly selected. All doctors (n= 22) and all occupational health nurses (n=10) were included due to small numbers. Nurses from occupational health, TB, wellness and medical clinics and wards were targeted since employees with respiratory illness due to OLD, occupational asthma or other smoking related conditions were more likely to present to these departments. Furthermore, these departments would be the pilot sites of choice for any future smoking intervention programmes.

A random list of 42 nurses was generated using EpiInfo Version 6.04d. This list was matched to names and forwarded to the Human Resources (HR) Officer to facilitate the distribution, completion and collection of questionnaires.

Informal “discussions”, not part of the original study protocol, were conducted on 4 HCWs (2 enrolled nurses and 2 professional nurses) at LWPH. These HCWs requested to be “interviewed” after knowledge of the study became known to them during the medical ward admission record reviews. An informal discussion was held with all of them simultaneously.

2.3.2 Cases of occupational lung disease

Routinely diagnosed OLD submitted to the Medical Bureau for Occupational Diseases (MBOD) were drawn from the Kloof OHC. A random sample of 150 was selected from a list of 216 cases of OLD, namely TB, silicosis and COAD. These cases were submitted for

compensation to the MBOD. The list was generated from an electronic Approach database and from the Palladium health and safety database, for the study period 1 January to 30 June 2003. No identifiers, such as names and industry numbers (unique number assigned to mine workers by TEBA[c]) were used. A random list (n=150; 69.4%) of cases, using EpiInfo version 6.04d, was generated.

Diagnosed and certified cases of occupational asthma for the period 1 January 2004 to 30 January 2006 were identified (n=11). These cases were unique in that all were attended to and followed up by the occupational medical practitioner (OMP).

2.3.3 Medical ward admission records

Record reviews of OLD were mainly diagnosed by one OMP (the researcher) and it was decided to extend the study to include retrospective medical ward admission record reviews. Medical ward admission notes (n=30) were reviewed on 13 October 2006.

2.4 Measurement tools

2.4.1 Self-administered questionnaires

The 'Global Health Professional Survey' developed by the WHO and a guideline on 'How to do it? Design the questionnaire' [60] were utilised. These were supplemented with specific questions related to mine workers to generate the 'Health Care Workers' Tobacco Questionnaire' (Appendix 2). Demographic information, knowledge and attitudes of HCWs about prevention of smoking, and information about practices, were elicited.

For most of the knowledge and attitude questions responses were measured on a scale of 1 to 5, where:

1 = strongly agree
2 = agree
3 = unsure
4 = disagree
5 = strongly disagree

'Yes' or 'no' responses were used for some questions regarding knowledge and attitudes, and for the majority of questions regarding workplace practices. There were two open-ended questions about workplace practices and possible interventions and strategies HCWs deemed necessary to curb smoking, and activities that could feasibly be included in a smoking intervention programme. Questions about knowledge, attitudes and practices

[c] TEBA – The Employment Bureau of Africa

were intentionally scattered throughout the questionnaire, to encourage generation of ideas.

The questionnaire was piloted amongst five colleagues (medical doctors) who were not part of the study population and not employed by Gold Fields. No limitations or concerns were raised. Minor changes to the questionnaire were made.

2.4.2 Record reviews

Record reviews of OLD, to document actual practices of HCWs and patients' responses to HCWs' advice, were completed by the researcher. A data collection sheet (Appendix 3) was devised for this purpose. The objective was to document HCWs' workplace practices in relation to employees with established OLD, and to determine the response to that advice. With regard to the employees with occupational asthma cases, the objective was specifically to determine the response to doctors' advice. This measurement tool was selected to supplement the questionnaire's qualitative contribution; and to validate and compare responses HCWs provided in the questionnaire, regarding their practices when managing smoking mine workers.

Data recorded at the first visit to the OHC, included the date of that visit, OLD diagnosis and date of diagnosis. Smoking status (current, never or ex) was also documented. If smoking status was not documented this was recorded as "unknown". The advice given (if any), and the response to that advice were recorded.

Nine pilot record reviews were conducted on the occupational asthma cases, after which the data collection sheet was revised (Appendix 4) with the following amendments:

- "Unknown (not asked)" was added as a response to smoking status at time of diagnosis
- "Previously documented" with a yes/no response was added, in addition to the date and smoking status
- "NA" or not applicable was added as a response to "advised to stop smoking?" as this would be an appropriate answer for an ex/never smoker
- "Advised never to start smoking?" was added as a response, as this would be an appropriate answer for an ex/never smoker
- Visits number 2 and 3 required an additional option, namely, "not asked"

The nine record reviews were then repeated using the amended form and included in the total sample.

Retrospective record reviews of medical ward admissions were conducted as an extension to the existing OLD record reviews, to further compare actual practices of HCWs to reported practice. A data collection sheet (Appendix 5) was devised for this purpose and completed by the researcher.

2.5 Data Collection

2.5.1 Self-administered questionnaires

All participants were given an information sheet (Appendix 6), and an anonymous, self-administered questionnaire (Appendix 2) in an envelope, and invited to complete the questionnaires during normal working hours. The HR officer personally collected the completed questionnaires. These were couriered back to the researcher in batches over a two-month period, namely, November 2005 to January 2006. The data were double-punched into a password-protected personal computer by the researcher, using EpiInfo version 6.04d.

2.5.2 Record reviews

The researcher completed the data collection sheets. Consistency and quality in data capturing was checked by repeating some records randomly throughout the data collection process and comparing with the original data entry. The data for the OLD were double-punched into a password-protected personal computer by the researcher, using EpiInfo version 6.04d. The data for the medical ward admission cases was analysed manually by the researcher.

2.6 Confidentiality and ethics

Permission was obtained from GFHS (Appendix 7) to perform the self-administered questionnaires. Ethical clearance was obtained from the University of the Witwatersrand Committee for Research on Human Subjects (Medical), clearance certificate protocol number M050723 (Appendix 8). The Post Graduate Committee approved the study protocol.

The questionnaire (Appendix 2) was accompanied by an information sheet (Appendix 6) and informed consent was implied by the return of the anonymous questionnaire. No records could be linked back to individuals and no names were required at any stage during the research. The participants were assured that the results would be presented in a grouped format so that no individual could be identified.

2.7 Analysis

All data were analysed at the School of Public Health, University of the Witwatersrand using standard statistical software EpiInfo version 6.04d. Simple frequency distributions were constructed. Tables were generated to compare demographic characteristics of doctors compared to nurses. Knowledge, attitudes and workplace practices were also analysed by profession (doctors versus nurses). Proportions were compared using Chi-squared analysis. Where the expected value in a cell was less than five, the Fischer Exact test was used. The Mantel-Haenszel x^2 test was used in all other cases. The statistical significance was determined at the 95% confidence level.

For the questionnaire, calculations were made using the total number of HCWs, doctors and nurses as the denominator; non-respondents were included. The responses to the open-ended questions regarding what the mines could do to assist workers to reduce smoking, and what HCWs could do to achieve the same, were coded into categories. Due to small numbers questions were analysed by grouping “strongly agree” and “agree” into “agree” responses, and “strongly disagree” and “disagree” into “disagree” responses. “Unsure” responses were ignored.

For the record reviews, “ever smokers” were defined as those subjects who were current or ex-smokers.

CHAPTER 3: RESULTS

3.1 Self-administered questionnaires

3.1.1 Demographic information

Table 3.1 shows the demographic characteristics of the HCWs from whom questionnaires were received. 69 questionnaires were completed by HCWs. All of the 52 nurses completed the questionnaire (100% response rate). Seventeen of the 22 doctors completed the questionnaire (77.3% response rate). Completed questionnaires comprised 75.4% of nurses and 24.6% of doctors. Half of the nurses were female (55.8%) while 82.4% of the doctors were male (n=14). The difference in gender distribution among doctors and nurses was statistically significant (p = 0.0115).

Table 3.1 Demographic information of HCWs

Characteristics	**Doctors (n = 17)**		**Nurses (n = 52)**		**Total (n = 69)**	
Gender	**n**	**%**	**n**	**%**	**n**	**%**
Male	14	82.4	22	42.3	36	52.2
Female	3	17.6	29	55.8	32	46.4
Unknown	0	-	1	1.9	1	1.4
Total	**17**	**-**	**52**		**69**	
Qualification						
Degree	17	100	8	15.4	25	36.2
Diploma	0	-	32	61.5	32	46.4
Certificate	0	-	10	19.2	10	14.5
No response	0	-	2	3.8	2	2.9
Total	**17**		**52**		**69**	
Smoking status						
Yes	3	17.6	8	15.4	11	15.9
No	12	70.6	35	67.3	47	68.1
Ex smoker	2	11.8	9	17.3	11	15.9
Total	**17**		**52**		**69**	
Years in mining						
0-5	6	35.3	10	19.2	16	23.2
6-10	7	41.2	13	25	20	28.9
11-15	1	5.9	8	15.4	9	13
16-20	2	11.8	6	11.5	8	11.6
>20	0	-	11	21.2	11	15.9
No response	1	5.9	4	7.7	5	7.2
Total	**17**		**52**		**69**	

Of the HCWs, 11 (15.9%) were current smokers. Similar proportions of doctors and nurses were smokers (17.6% and 15.4% respectively). There were 11 (15.9%) ex-smokers. There was about a third (n=22; 31.9%) of “ever” smokers; 29.4% were doctors and 32.7% were nurses.

Most doctors (n=13; 76.5%) had at least 10 or less years experience in mining while 48.1% of nurses had more than 10 years experience. The mean age of the study sample was 42.8 years. The difference in the mean ages of the doctors and nurses was not statistically significant (p = 0.4604).

3.1.2 Knowledge

3.1.2.1 Health

Table 3.2 shows the results of the following knowledge questions: 7, 18, 20, 21, 22, 27 and 28 of the questionnaire (Appendix 2). Most HCWs agreed that smoking is harmful to their health and to the health of mine workers (98.6% and 97.1% respectively). The differences between doctors and nurses were not statistically significant. One HCW felt that smoking is not harmful to one’s health. Most (n=66; 95.7%) agreed that smoking is addictive. The same proportion agreed that tobacco use predisposes mine workers to acquiring lung diseases.

Most (81.5%) HCWs felt that smoking results in more illness, thereby decreasing productivity. Less than half (n=30; 43.5%) of the HCWs agreed that smoking increases mine workers risk of mine accidents. The majority (53.8%) of nurses agreed, while 11.8% of doctors agreed. This question (27) was the only question with a statistically significant difference between doctors and nurses in this batch (p=0.0033).

Regarding smoking and risk for OLD in mine workers, table 3.3 (question 29) shows that 76.8% believe that smoking increases the risk of acquiring lung cancer; 79.7% believe the same for TB, 71.0% for silicosis and 92.8% for COAD. There was no statistically significant difference between responses of doctors and nurses.

Table 3.3 “Yes” responses to smoking and risk for OLD (Question 29)

DISEASE	DOCTORS (N=17)		NURSES (N=52)		TOTAL (N=69)		P-VALUE
	n	%	n	%	n	%	
Lung cancer	12	70.6	41	78.8	53	76.8	0.3466
TB	12	70.6	43	82.7	55	79.7	0.2849
Silicosis	12	70.6	37	71.2	49	71.0	0.5219
COAD	16	94.1	48	92.3	64	92.8	0.1089

Twenty-five (36.2%) HCWs felt that one would have to smoke “a lot” to acquire any of these diseases, while the same proportion felt that one would not have to smoke at all; 14 (20.3%) felt they would have to smoke a little; and one (1.4%) did not know. There were no statistically significant differences between doctors and nurses (p values > 0.05).

3.1.2.2 Advice and record keeping

Table 3.4 shows the responses to questions 23 to 26 of the questionnaire (Appendix 2). Most (n=66; 95.6%) HCWs agreed that all mine workers should be routinely advised to quit smoking. The majority (n=67; 97.1%) agreed that newly engaged non-smoking workers should be advised never to start smoking; and that newly engaged smoking workers should be advised to quit smoking (n=68; 98.6%); although fewer (n=53; 76.8%) agreed that smoking status should be routinely documented. There were no statistically significant differences between doctors and nurses (p values > 0.05).

3.1.2.3 Smoking in mine workers

Figure 3.1 shows that the majority (n=58; 84.1%) of HCWs believe that the percentage of smoking amongst mine workers is higher than 40%. 62% of nurses felt that the rate was higher than 60%, while 23.5% of doctors felt it was more than 60%. This difference was statistically significant (p=0.0054).

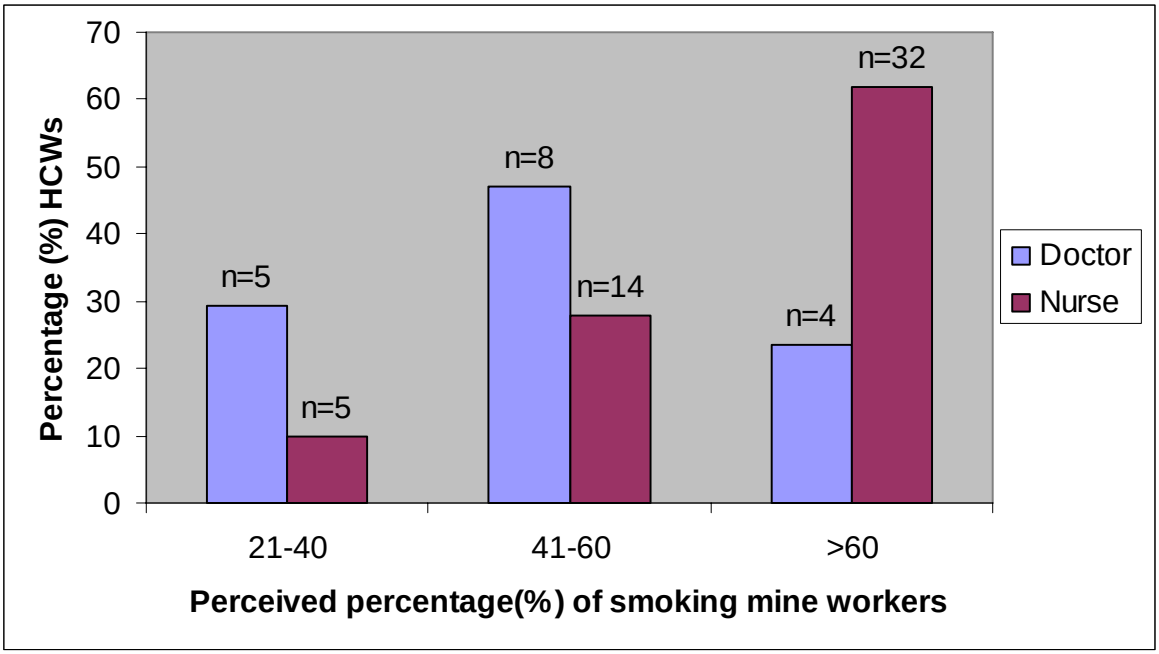


Figure 3.1 Distribution of responses to estimate of percentage of smoking mine workers

Table 3.2 HCW responses to questions on knowledge

		DOCTORS (N=17)						NURSES (N=52)						TOTAL (N=69)						P-VALUE
		Agree		Disagree		Unsure		Agree		Disagree		Unsure		Agree		Disagree		Unsure		
*Q#		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
7	Smoking is harmful	17	100	0	-	0	-	51	98.1	1	1.9	0	-	68	98.6	1	1.4	0	-	0.7536
18	Smoking is addictive	15	88.2	0	-	2	11.8	51	98.1	1	1.9	0	-	66	95.7	1	1.4	2	2.9	0.7761
20	Mine workers' smoking prevalence is higher than general population	5	29.4	4	23.5	8	47.1	14	26.9	6	11.5	31	59.6	19	27.5	10	14.5	39	56.5	0.3638
21	Smoking is harmful to health of mine workers	17	100	0	-	0	-	46	88.5	0	-	2	3.8	67	97.1	0	-	2	2.9	
22	Tobacco use predisposes mine workers to acquiring lung diseases*	16	94.1	0	-	1	5.9	50	96.2	1	1.9	0	-	66	95.7	1	1.4	1	1.4	0.7611
27	Smoking increases mine workers risk of mine accidents*	2	11.8	7	41.2	8	47	28	53.8	8	15.4	15	9.6	30	43.5	15	7.2	23	33.3	0.0033**
28	Smoking results in more illness decreasing productivity	13	76.5	3	17.6	1	5.9	43	82.7	3	5.8	6	11.5	56	81.5	6	8.7	7	10.1	0.1723

* Question number
**Statistically significant

Table 3.4 HCW responses to questions on counselling

		DOCTORS (N=17)						NURSES (N=52)						TOTAL (N=69)						P-VALUE
		Agree		Disagree		Unsure		Agree		Disagree		Unsure		Agree		Disagree		Unsure		
*Q#		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
23	All mine workers routinely advised to quit smoking	17	100	0	-	0	-	48	92.3	0	-	3	5.8	66	95.6	0	-	3	4.3	-
24	Newly engaged non-smoking workers advised never to start smoking	16	94.1	1	5.9	0	-	50	96.2	0	-	1	1.9	67	97.1	1	1.4	1	1.4	0.2537
25	Newly engaged smoking workers advised to stop smoking	16	94.1	1	5.9	0	-	51	98.1	0	-	0	-	68	98.6	1	1.4	0	-	0.2500
26	Mine workers smoking status routinely documented	13	76.5	1	5.9	3	17.6	40	76.9	1	1.9	11	21.2	53	76.8	2	2.9	1.4	20.3	0.4478

* Question number

3.1.2.4 Counselling and training

Table 3.5 shows the responses to question 35 of the questionnaire (Appendix 2). 22.7% of HCWs felt that they were not at all prepared to counsel patients on how to stop smoking; 42.4% were somewhat prepared and 34.8% were very well prepared. There was no statistically significant difference between doctors and nurses (p=1.000).

Table 3.5 HCW responses to how well prepared when counselling (Question 35)

	Doctor		**Nurse**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**
Not at all	4	23.5	11	21.2	15	21.7
Somewhat prepared	7	41.2	21	40.4	28	40.6
Very well prepared	5	29.4	18	34.6	23	33.3
No response	**1**	5.8	2	3.8	3	4.3
Total	**17**		**52**		**69**	

Figure 3.2 illustrates the formal training on smoking cessation received by HCWs. One (5.9%) doctor had received formal training at medical school, while 14 (26.9%) nurses had received training at nursing college.

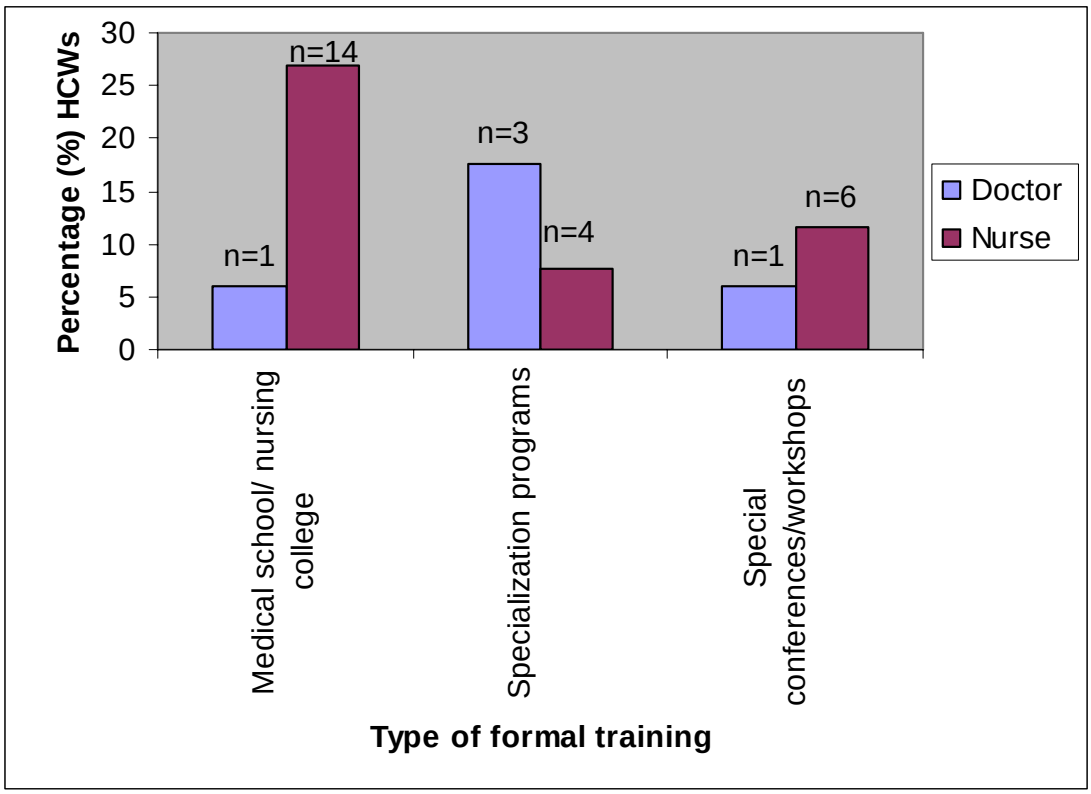


Figure 3.2 Formal training received by HCWs

Three (17.6%) doctors and four (7.7%) nurses had attended specialization programmes where smoking cessation education was given. One doctor (5.9%) and six nurses (11.5%) had received training at conferences and workshops. A higher proportion of nurses (n=24; 46.2%) had received formal training, compared to doctors (n=5; 29.4%). A higher proportion of doctors received training during specialisation programmes (postgraduate level), while most nurses were trained at nursing college (undergraduate level). There were no statistically significant differences between responses of nurses and doctors (p values > 0.05) with regard to formal training received.

3.1.3 Attitudes

3.1.3.1 Training and cessation

Table 3.6 shows the responses to questions 14 to 17 of the questionnaire (Appendix 2). Nearly half (47.8%) agreed that they are adequately trained; 95.7% felt that health professionals should get specific training on cessation techniques. There was no statistical difference (p=0.2265), between doctors and nurses for these questions. Nearly all (n=51; 98.1%) nurses would like to be involved in smoking programmes, compared to 64.7% of doctors (n=11). Most (n=42; 80.8%) nurses would like to belong to an anti-tobacco organisation, compared to 29.4% of doctors (n=5). For both these questions there was a statistically significant difference between doctors and nurses p=0.0083 and p=0.0059 respectively.

3.1.3.2 Smoking advice

Table 3.7 shows the responses to questions 8 to 13 of the questionnaire (Appendix 2). Most (n=63; 91.3%) felt that health professionals serve as role models to their patients and the public. 76.5% of doctors (n=13) and 96.2% of nurses (n=50) agreed. The majority (38; 74.5%) of nurses strongly agreed, while only 47.1% of doctors (n=8) strongly agreed. Only 7.2% (n=5) disagreed that they were role models. A correlation for smoking status of HCW and attitude towards being a role model was done. A statistically significantly high proportion of non-smokers think that HCWs serve as role models (p=0.0308).

Fifty four (78.3%) subjects agreed that patients' chances of quitting are increased if a health professional advises him or her to quit. Most (n=68; 98.6%) HCWs felt that health professionals should routinely ask about their patients' smoking habits and that health professionals should routinely advise their smoking patients to quit (n=66; 95.6%). 100% of doctors felt that all patients with known respiratory illness should be advised to quit, while 98.1% of nurses felt the same; 84.1% (58) agreed that smoking should be

managed like any other chronic disease[d]. There was no statistically significant difference in responses to these questions, between doctors and nurses (p-values > 0.05).

Table 3.8 shows the responses to question 37 of the questionnaire (Appendix 2). Most (n=62; 89.9%) HCWs stated that they routinely counsel patients against smoking when they knew that patients have a lung disease. Over half (n=43; 62.3%) stated that they would counsel if they knew that the patient smokes. Less than a quarter (n=15; 21.7%) stated that they would counsel when they knew that the patient does not smoke; 79.7% would counsel if the patient had a lifestyle illness. There were no statistically significant differences in response between doctors and nurses (p-values > 0.05).

3.1.3.3 Smoking in mine workers

Table 3.9 shows responses to questions 23 to 26. Most (n=66; 95.7%) agreed that all mine workers should be routinely advised to quit smoking. The majority 97.1% (n=67) of HCWs felt that on engagement, non-smoking workers should be advised never to start smoking, while 98.6% (n=68) felt that newly engaged smoking workers should be advised to stop. Fewer (n=53; 76.8%) HCWs agreed that mine workers' smoking status should be routinely documented; similar proportions (76.5% and 76.9% respectively) for doctors and nurses were noted. There were no statistically significant differences between doctors and nurses (p-values > 0.05).

3.1.4 Workplace practices

Questions 31 to 33 of the questionnaire addressed the issue of smoke-free policies. The majority (n = 56; 81.2%) HCWs responded to the question about smoke-free policies at the workplace; 24.6% (n=17) said that there was no smoking policy in place; 44.9% (n=31) said that there were smoking rooms available, and 11.6% (n=8) said that there were no smoking rooms allowed at all on the premises. There were fewer (n=50; 72.5%) responses to whether the smoke-free policy was enforced, with 31.9% (n=22) stating that the smoke-free policy was always enforced.

d Chronic diseases at GFHS (WW), are diagnosed at the medical stations or at the hospital, and managed in the out patients' department with regular follow up by nurses and/or doctors, according to set protocols.

Table 3.6 HCW responses to attitudes on training and cessation

		DOCTORS (N=17)						NURSES (N=52)						TOTAL (N=69)						P-VALUE
		Agree		Disagree		Unsure		Agree		Disagree		Unsure		Agree		Disagree		Unsure		
*Q#		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
14	Doctors and nurses are adequately trained to help patients to quit smoking	7	41.2	9	52.9	1	5.9	26	50	17	32.7	9	17.3	33	47.8	26	37.7	4	5.8	0.2265
15	Health professionals should get specific training on cessation techniques	15	88.2	1	5.9	1	5.9	51	98.1	0	-	1	1.9	66	95.7	1	1.4	2	2.9	0.2388
16	Like to be involved in a smoking cessation programme at the workplace	11	64.7	3	17.6	3	17.6	51	98.1	0	-	1	1.9	62	89.9	3	4.3	4	5.8	0.0083**
17	Like to belong to an anti-tobacco organisation	5	29.4	5	29.4	7	41.2	42	80.8	4	7.7	6	11.5	47	68.1	9	13	13	18.8	0.0059**

*Question number
** Statistically significant

Table 3.7 HCW responses to attitudes towards smoking advice

		DOCTORS (N=17)						NURSES (N=52)						TOTAL (N=69)						P-VALUE
		Agree		Disagree		Unsure		Agree		Disagree		Unsure		Agree		Disagree		Unsure		
*Q#		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
8	HCW are role models	13	76.5	3	17.6	1	5.9	50	96.2	2	3.8	0	-	63	91.3	5	7.2	1	1.4	0.0807
9	Chances of quitting increased if health professional advises to quit	13	76.5	2	11.8	2	11.8	41	78.8	3	5.8	7	13.5	54	78.3	5	7.2	9	13	0.3763
10	Health professionals routinely ask about smoking habits	17	100	0	-	0	-	51	98.1	0	-	0	-	68	98.6	0	-	0	-	-
11	Health professionals routinely advise their smoking patients to quit*	16	94.1	0	-	1	5.9	50	96.2	0	-	1	1.9	66	95.6	0	-	2	2.9	-
12	Health professionals routinely advise all patients with known respiratory diseases to quit	17	100	0	-	0	-	51	98.1	1	1.9	0	-	68	98.6	1	1.4	0	-	0.7536
13	Smoking should be managed like any other chronic disease	13	76.5	3	17.6	1	5.9	45	86.5	4	7.7	3	5.8	58	84.1	7	10.1	4	5.8	0.2265

*Question number

Table 3.8 Routine counselling against smoking (Question 37)

	DOCTORS						NURSES						TOTAL						P-VALUE
	Yes		No		NR*		Yes		No		NR*		Yes		No		NR*		
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
If you are aware they have lung disease	15	88.2	1	5.9	1	5.9	47	90.4	5	9.6	0		62	89.9	6	157.9	1	1.4	0.5659
If you know that they smoke	11	64.7	5	29.4	1	5.9	32	61.5	17	32.7	3	5.8	43	62.3	22	31.9	4	5.8	0.8019
If you know that they do not smoke	2	11.8	14	82.4	1	5.9	13	25	36	69.2	3	5.8	15	21.7	50	72.5	4	5.8	0.2117
If they have a lifestyle disease	15	88.2	1	5.9	1	5.9	40	76.9	8	15.4	4	7.6	55	79.7	9	8.7	5	7.2	0.2801
*NR = no response																			

Table 3.9 Attitudes towards smoking in mine workers

		DOCTORS (N=17)						NURSES (N=52)						TOTAL (N=69)						P-VALUE
		Agree		Disagree		Unsure		Agree		Disagree		Unsure		Agree		Disagree		Unsure		
*Q#		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
23	All mine workers routinely advised to quit smoking	17	100	0	-	0	-	48	92.3	0	-	3	5.8	66	95.6	0	-	3	4.3	-
24	Newly engaged non-smoking workers advised never to start smoking	16	94.1	1	5.9	0	-	50	96.1	0	-	1	1.9	67	97.1	1	1.4	1	1.4	0.2537
25	Newly engaged smoking workers advised to stop smoking	16	94.1	1	5.9	0	-	51	98.1	0	-	0	-	68	98.6	1	1.4	0	-	0.2500
26	Mine workers smoking status routinely documented	13	76.5	1	5.9	3	17.6	40	76.9	1	1.9	11	21	53	77	2	2.9	1.4	20	0.4478
*Question number																				

Figure 3.3 shows the response to question 38. Most doctors (n=9; 52.9%) felt that 1-5 minutes was sufficient. A higher proportion of nurses (n=18; 34.6%) were in favour of 10 – 20 minutes compared to 17.6% of doctors (n=3). However, a few nurses (n=6; 8.7%) and one doctor (5.9%) felt that more than twenty minutes was necessary.

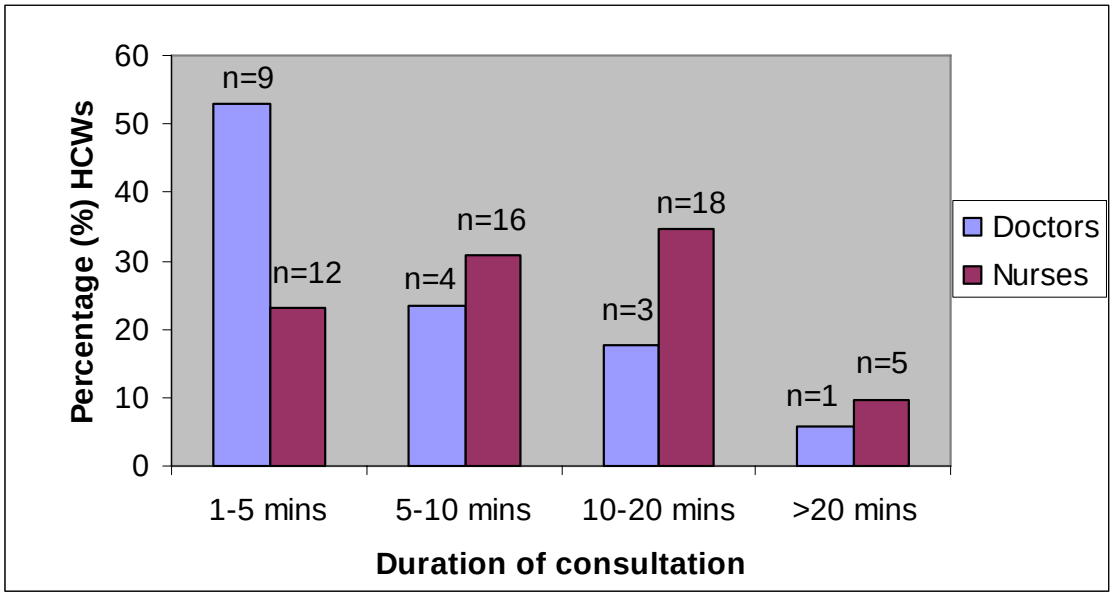


Figure 3.3 HCWs responses to duration of consultation

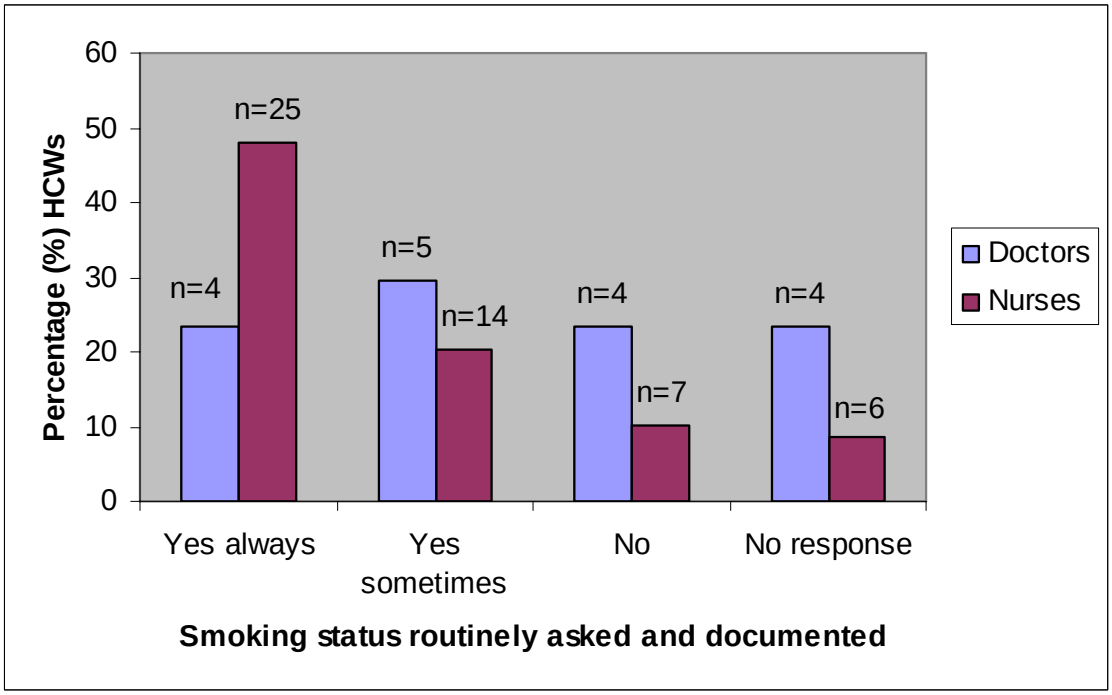


Figure 3.4 Responses to HCWs routinely ask smoking status and document

Figure 3.4 shows the responses to question 33. More nurses than doctors responded that they would always routinely ask smoking status and document it and this

difference was statistically significant (p=0.0014): about half (n=25; 48.1%) of the nurses responded positively while four (23.5%) doctors responded likewise. 27.5% (n=19) of HCWs would document it sometimes, and 15.9% (n=11) would not document it at all.

Figure 3.5 shows the responses to question 34. Counselling was the most favoured intervention for HCWs; 17.6% of doctors felt that counselling was available to them to assist mine workers, compared to 42.3% of nurses. This difference was statistically significant (p=0.0350). No statistically significant differences were found for the other intervention modalities. One 'other' suggestion made by a nurse was that general advice was available, and another stated that advice on gradual quitting was available.

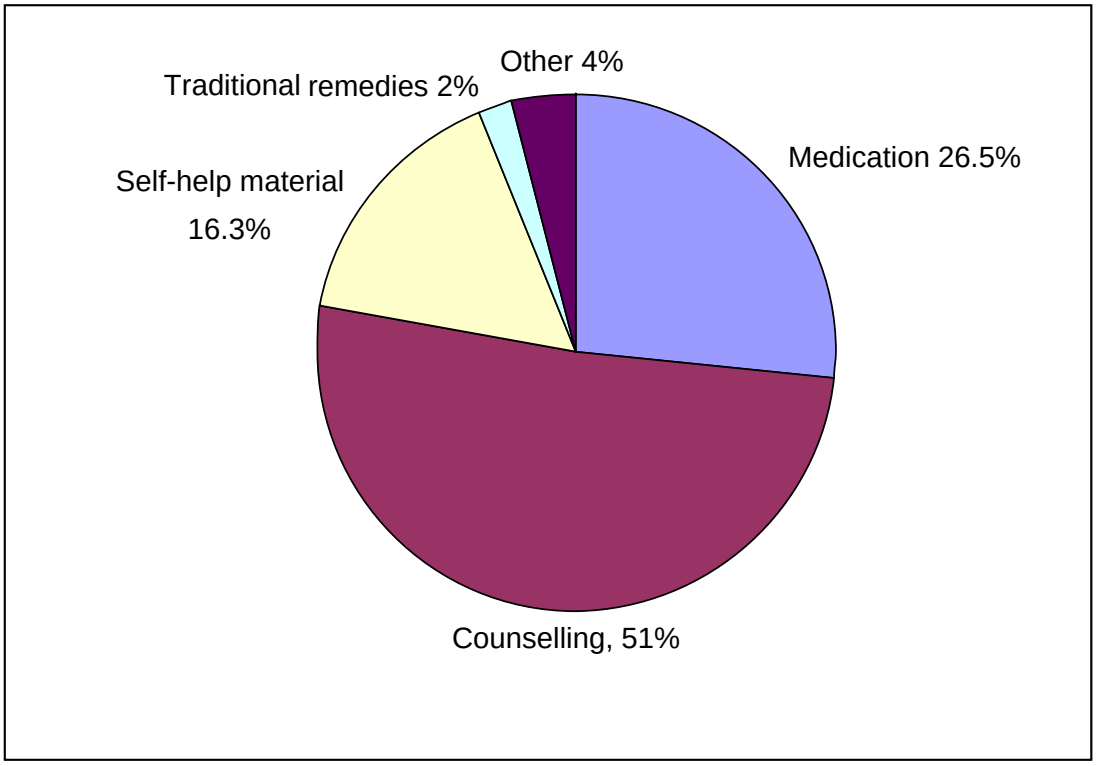


Figure 3.5 Responses to interventions available to HCWs

3.1.5 Workplace strategies: responses to open-ended questions

HCWs were asked what the mines could do to assist workers to reduce smoking, and what HCW could do, in their routine practice.

3.1.5.1 What can the mines do?

Sixty-four (92.8%) of the 69 HCWs responded to question 49 on how the mines can assist employees to reduce smoking. From Figure 3.6 it can be seen that the majority (45.3%) of responses were related to the mines assisting by having formal smoking policy or programme[e] for their workers. Within the framework of a policy or programmef, HCWs suggested that there must be a smoking behaviour-based discipline and reward system in place; the smoking policy must be highlighted in the conditions of employment. HCWs felt that smoking areas must be clearly demarcated, and "sale of cigarettes must be prohibited in the hostels and the hospital". This policy must be in line with legislation and the national anti-smoking campaign. It must address training of counsellors who must then target high risk populations. The policy must reach out to communities and families as well, to be effective. HCWs felt that, to be successful the programme must "integrate with existing health structures such as the HIV programme".

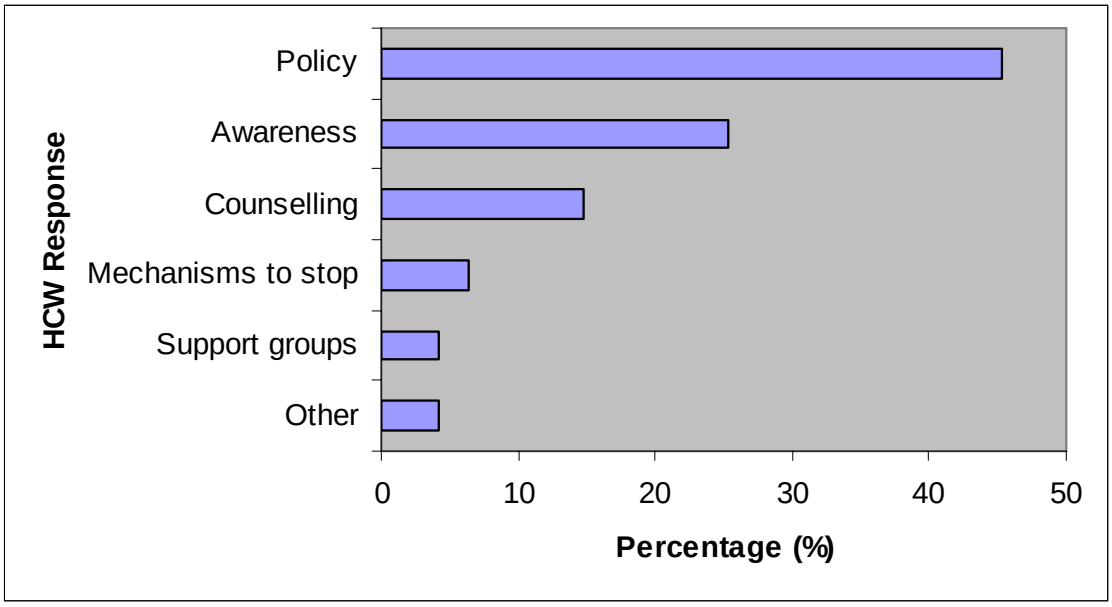


Figure 3.6 Distribution of responses on how the mines can contribute to assist workers to reduce smoking

Awareness campaigns (25.3% of responses) must utilise audiovisual aids such as live displays, videos, pamphlets, posters and self-help material. Self-help material must be easily accessible at strategic points. Counselling services (14.7% of responses) emphasising the dangers of smoking, must be freely available. Respondents requested assistance with mechanisms to stop, e.g. "Zyban must be accessible and free". In the hostel setup, workers must be provided with alternative recreational activities. On the

[e] Policy and programme were used synonymously in the HCW responses

mines, the “working environment must be enhanced to prevent workers from smoking due to stress”. One HCW stated that “it is in the hostels where risky behaviour, including lots of smoking is being promoted”. Support groups and other interventions such as communication and active involvement by mine management, unions and HCWs were also highlighted.

3.1.5.2 What can HCWs do?

Sixty-four (92.8%) of the 69 HCWs responded to question 50 on how HCWs can assist employees to reduce smoking.

Figure 3.7 shows that the majority (64.4%) of respondents stated that HCWs, in their routine practice, could assist workers to reduce smoking by counselling. This counselling should include aspects of the health effects and dangers of smoking, whereby “real life examples of affected people” are used. It should be part of their routine work. “Workers must be provided with information pamphlets and self-help material as well as counselling”. All mine workers should be counselled especially those who have “existing occupational or other lung diseases”. This counselling must be regular, repeated and tailored to the individuals. One HCW suggested that it must be done before the patient sees the doctor, so he/she can ask the doctor the relevant questions. Designated counsellors who are well-trained and dedicated to anti-smoking must be recruited. The latter will ensure that correct information is given, “so workers will feel empowered to make the correct decisions”.

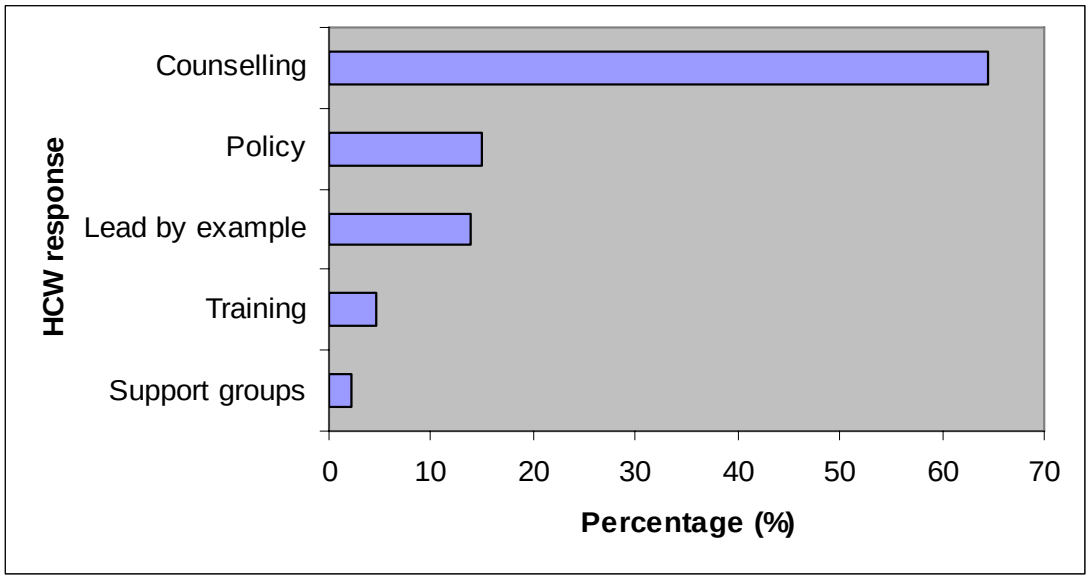


Figure 3.7 Distribution of responses on how HCWs can assist workers to reduce smoking

A low proportion (14.9%) of responses favoured a formal smoking policy that enforces the law. The anti-smoking programme must be well communicated to all HCWs and mine workers, and must be accessible. It must incorporate reward systems for successful quitting; it must encourage friends and family to sign up. One HCW stated that smoking areas must be enforced, implying that there was lack of compliance within the health structures.

HCWs should lead by example (13.8% of responses). HCWs "should not smoke in front of their patients; they must be committed to the patient in "assisting them to create a will to stop." Training was listed as a separate item in 4.6% of responses. To be able to counsel appropriately, HCWs must undergo training. In-service training and participation in continuing medical education programmes, is vital.

Other strategies such as support groups for both smoking and non-smoking mine workers and HCWs is critical. Providing workers with self-help material was also suggested.

3.2. Record reviews

Figure 3.8 shows that of the 150 cases of OLD and 11 cases of Occupational Asthma reviewed, the majority (111; 68.9%) were diagnosed with TB. Thirty (18.6%) had silicosis and 9 (5.6%) had COAD. Occupational Asthma comprised 6.8% of the sample.

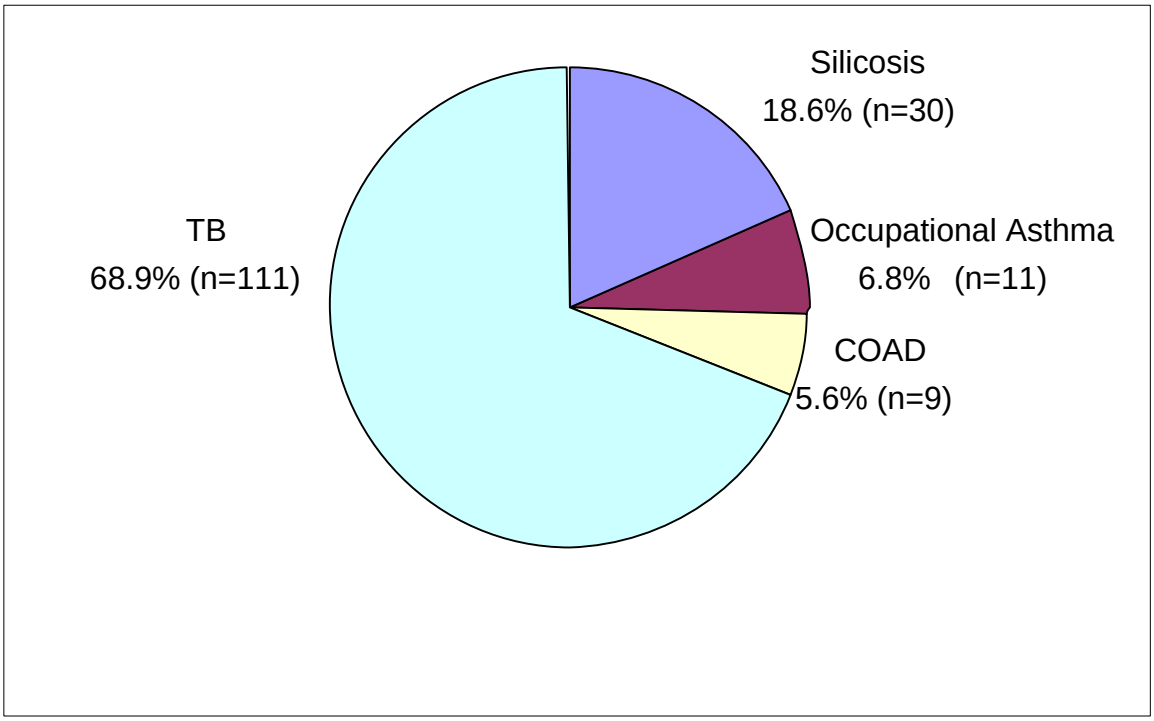


Figure 3.8 Distribution of occupational lung diseases and occupational asthma among records reviewed

3.2.1 Smoking status

Table 3.10 shows that, at the first visit to the OHC, the smoking status of the majority (117; 72.7%) of the 161 mine workers was not recorded. The majority of these miners (104; 88.9%) had TB.

Of those for whom smoking status was recorded (n=44; 27.3 %), 31.8% (n=14) were current smokers, 25.0% (n=11) were ex-smokers and 43.2% (n=19) had never smoked. Figure 3.9 shows that a higher proportion had “ever smoked” (25; 56.8%) than had never smoked (n=19; 43.2%) while Figure 3.10 shows that most of the 25 “ever” smokers, had silicosis (n=10; 40%), followed by occupational asthma (n=7; 28%); there were equal proportions of subjects with TB and COAD (n=4; 16%).

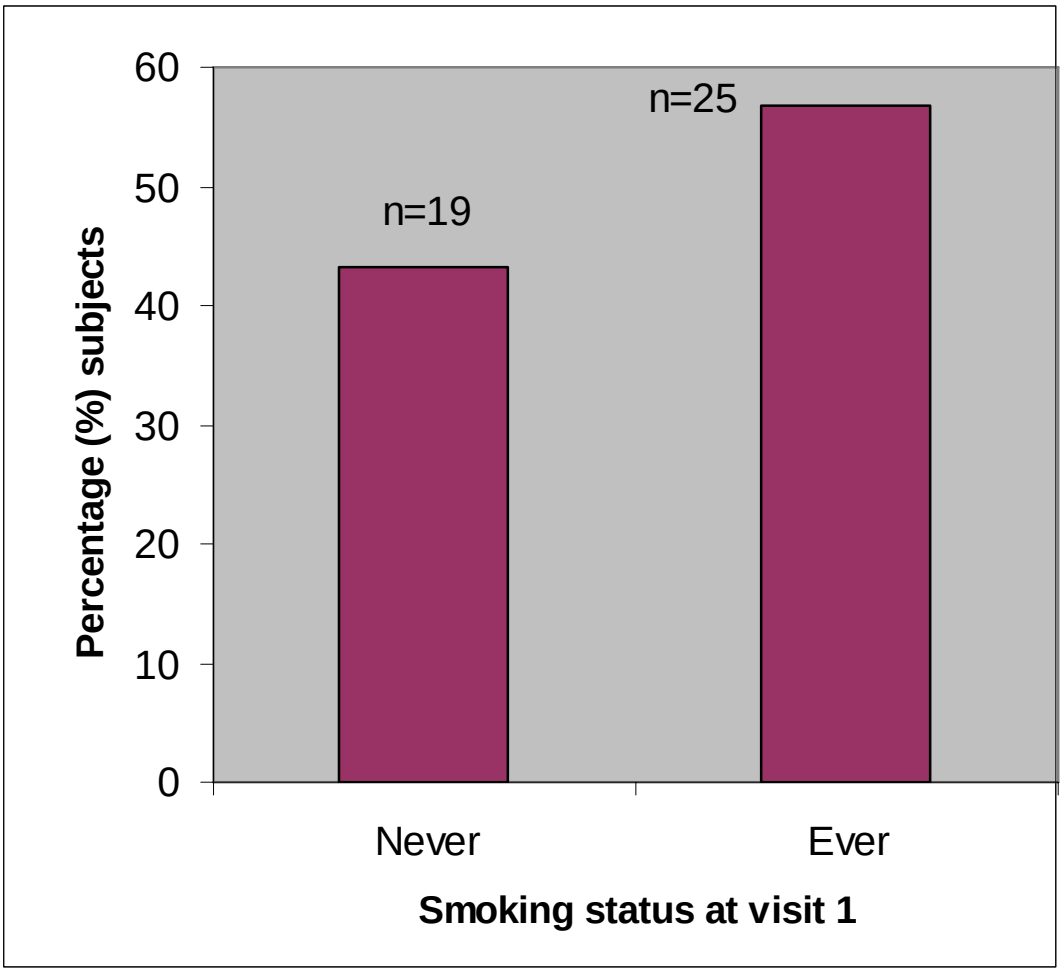


Figure 3.9 Smoking status at visit 1

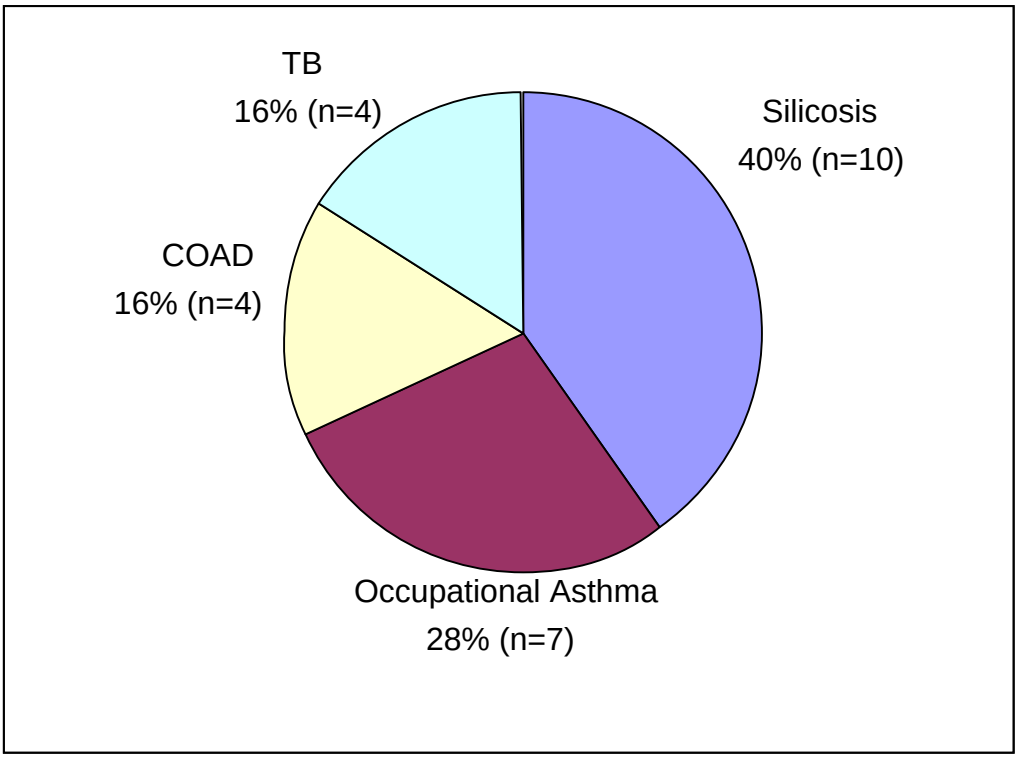


Figure 3.10 Distribution of diseases in “ever” smokers

3.2.2 Smoking advice and follow up

Table 3.11 shows that seven (50%) of the 14 current smokers were advised to stop smoking at visit 1.

At visit 2 to the OHC, five (71.4%) of these seven were not asked if they had stopped. One of the two who were asked was still smoking and had not reduced consumption; one had stopped smoking. This showed a success rate of 14.3%. This table shows that it was mainly doctors (n=5; 71.4%) who advised patients to stop smoking at visit 1. A positive response to doctors’ advice was observed in one case - a patient with silicosis had stopped smoking at visit 2, and was counselled by the doctor about passive smoking. However, this same man had resumed smoking at visit 3, with a reduction in previous consumption levels.

At visit 3, six out of the original seven, who had been given advice to stop smoking, had attended the OHC. Two had reduced the number of cigarettes they smoked, one had silicosis and the other had Occupational Asthma; one individual with COAD was still smoking with no reduction and three were not asked about their smoking status. The individual with Occupational Asthma was extensively counselled by numerous medical personnel to stop smoking and counselling was well documented.

These 7 cases had a total of 13 follow up visits (visits 2 and 3), and were asked about smoking status on 5 occasions (38.5%). One of the 30 “never” and “ex-smokers”,

was advised not to start smoking at visit 1. This man had occupational asthma and was advised by a doctor, at time of diagnosis, not to take up smoking.

3.3. Record reviews of medical ward admissions

The admission records of 30 medical ward in-patients were reviewed retrospectively. Figure 3.11 shows that no doctors enquired about smoking on admission. Few (n=17; 56.7%) nurses documented smoking history on admission. This difference in behaviour was statistically significant (p-value = 0.0000) and could be attributed to the fact that nurses are prompted to ask smoking history on a standard admission form, whereas doctors are not. One of the thirty patients was documented as a smoker although 73.3% (n=22) of this sample of patients in the medical ward had respiratory disease.

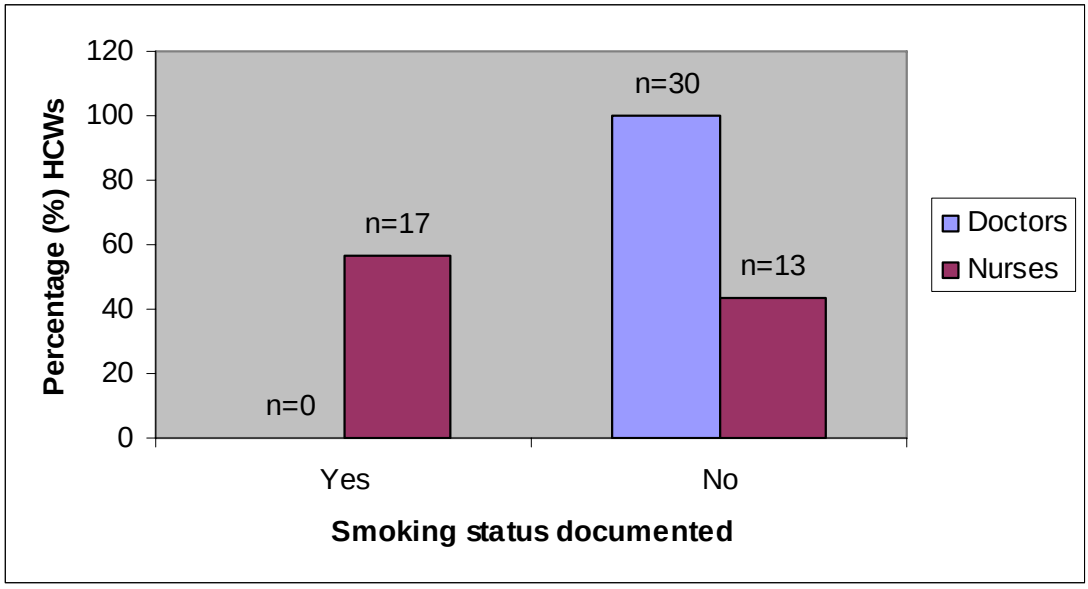


Figure 3.11 Record reviews of medical ward admissions to determine if smoking history was documented

Table 3.10 Smoking status of all diseases at visit 1

	Current		Never		Ex		Ever		Unknown		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
COAD	3	33.3	2	22.2	1	11.1	4	44.4	3	33.3	9	5.6
TB	3	2.7	3	2.7	1	0.9	4	3.6	104	93.6	111	68.9
Silicosis	6	20	10	33.3	4	13.3	10	33.3	10	33.3	30	18.6
Occupational Asthma	2	18.2	4	36.4	5	45.5	7	63.6	0	0	11	6.8
Total	14	8.7	19	11.8	11	6.8	25	16	117	72.7	161	100

Table 3.11 Detailed record review of the seven current smokers who were advised to stop at visit 1

	Diagnosis	Visit 1: advised by	Visit 2: seen by	Comment on advice	Visit 3: seen by	Comment on advice
1	TB	Nurse	Nurse	Not asked	Nurse	Not asked
2	Silicosis	Doctor	Nurse	Not asked	No follow up	No follow up
3	Silicosis	Doctor	Doctor	Not asked	Doctor	Not asked
4	COAD	Doctor	Doctor	Still smoking, no reduction	Doctor	Still smoking, no reduction noted
5	Silicosis	Doctor	Doctor	Stopped smoking; advised on effects of passive smoking	Doctor	Resumed smoking, reduction noted
6	Occupational asthma	Doctors-OMP/physician and occupational therapist	Doctor	Not asked	Doctor	Still smoking, reduction noted
7	Occupational asthma	Nurse	Nurse	Not asked	Nurse	Not asked

3.4. Informal discussions with HCWs

Informal discussions with HCWs revealed that they believed that they had a moral and professional duty to be role models to their patients. “How can we expect our patients to listen to us when we smoke in front of them and when we confront them and ask for a “loose[g]”?. Some HCWs felt that there should be no smoking rooms at all in hospitals; it does not set a good example even if complying with the law. “Even the mines should completely ban smoking, not only underground, but surface as well”. “At the hospital we make it very easy for patients to smoke, they have nice balconies outside their wards and nobody speaks to them about the health effects of smoking.” Some patients are quite reckless and even smoke inside in the toilets.

Nurses also felt that despite the pressures of work, when they have the opportunity to engage with the mine workers about lifestyle issues such as smoking, a level of trust is built, and nurses feel that they are addressing the worker holistically. “This creates a conducive environment for follow-up counselling. It is a win-win situation; we may not see the benefits now, but in years to come”. Some nurses say that most mine workers do not know the harm they are causing themselves by being exposed to both silica dust and smoking, and when given information, many are receptive and feel empowered.

g “Loose” is a colloquial term for a cigarette

CHAPTER 4: DISCUSSION OF STUDY FINDINGS

4.1 Introduction

The high smoking prevalence on the gold mines is an important public health problem. A smoking intervention programme has the potential to address a host of occupational health, public health and social issues on the mines. Such programmes are relatively inexpensive and easy to integrate into current health care systems.

4.2 Demographic information

Table 3.1 shows that there was an unexpectedly high proportion of male nurses (42.3%) compared to the public sector, where female nurses constitute the majority, as high as 98% in some institutions (Personal communication, J van Oudtshoorn, Johannesburg General Hospital, 19 December 2006). This could be attributed to mine medical services attracting more male incumbents due to the patients being predominantly male.

4.3 Knowledge

4.3.1 Health and smoking in mine workers

The overall knowledge of the HCWs was very good with an overwhelming majority aware that smoking is harmful to one's health; harmful to mine workers' health, and predisposes them to acquiring lung diseases.

Only a quarter thought that mine workers' smoking prevalence is higher than the general population. This was probably due to lack of knowledge of the national prevalence rates. However, most HCWs believe that the smoking prevalence is higher than 40% on the gold mines with a statistically significant higher proportion of nurses than doctors believing that the prevalence was greater than 60%. Thus nurses are probably more acutely aware of the behaviours of their patients than doctors.

The majority (81.2%) of HCWs agreed that smoking results in more illness thereby decreasing productivity at the workplace and there is sufficient evidence to support this[17,20,21]. Few HCWs thought that smoking increases mine workers risk of mine accidents. There was a statistically significant difference between doctors and nurses, with a higher proportion of nurses agreeing with this statement. While there is no evidence per se for smoking increasing risk of *mine* accidents, in 1979 the 'Surgeon General Report on Smoking and Health' showed that smokers have twice as many job-related accidents as non-smokers[21]. More recently heavy physical work has been found to be a stronger predictor of low back pain in smokers than in non-smokers[61] which could possibly predispose them to occupational back injuries. Thus workplace smoking interventions are as important an adjunct to HCW interventions.

4.3.2 Training

Less than half (47.8%) of HCWs thought they were adequately trained to assist smokers to quit. This was supported by an overwhelming majority (95.7%) who felt that health professionals should get specific training on cessation techniques. A statistically significant greater proportion of nurses than doctors would like to be involved in workplace smoking programmes. Since more nurses than doctors wish to be involved in a smoking cessation programme than doctors, it is vital that nurses are consulted as integral players in smoking interventions.

The responses to how well prepared HCWs felt to counsel, varied widely, indicating inconsistencies in the training on smoking cessation techniques received. A higher proportion of nurses received training at undergraduate level than doctors. This gap in the education system should be addressed with tertiary institutions. In 2005, in an editorial letter to the South African Medical Journal, Saloojee stated that curricula should be reviewed to include training in diagnosing, managing and treating tobacco dependence[62].Tobacco related diseases are caused by first or second-hand smoking, but tobacco dependence itself is a disease as described in the International Classification of Diseases (ICD-10). As such, tobacco dependence deserves appropriate treatment and follow-up by trained health professionals[48] and the majority (84.0%) of HCWs agreed that smoking should be managed like any chronic disease.

Despite the fact that less than a quarter of HCWs (21.7%) responded that they would counsel a non-smoker, the majority of HCWs (Table 3.9) are aware that newly engaged employees should be counselled to quit *and* not to start. This is fundamental in the mining setting, as 4% to 5% of mine workers commence smoking after employment[11]. Prevention of smoking in young people is an important thrust in the latest Tobacco Products Control Amendment Bill (2006)[7] and should be incorporated into workplace policy.

4.4 Attitudes

Most HCWs thought that health professionals serve as role models to their patients. This was elicited from both the questionnaires and the informal discussions with HCWs. In public, in communities and workplace settings, health professionals are the most knowledgeable on health matters and there is an expectation that they should act on the basis of this knowledge and be role models in society. Health professionals have a valuable role to play in the struggle against tobacco. ‘Professionally respected and popularly revered’ HCWs can use their clout and influence to support anti-tobacco initiatives[48]. Health professionals must show leadership by embracing and popularising good health promotion strategies.

Most HCWs supported the premise that a patient's chances of quitting are increased if a health professional advises him or her to quit, and they recognised the importance of eliciting smoking status and documenting it. However, in practice, this is not being done. Despite a high proportion of doctors and nurses (76.5% and 76.9% respectively, table 3.9) reporting that they would document smoking behaviour, in practice only 56.7% (Figure 3.11) of nurses and no doctors documented smoking history during a medical admission.

4.5 Workplace practices

The section on smoke-free policies was poorly answered and many HCWs are not aware of the existing policy while only 31.9% felt that the policy was enforced. Most (52.9%) doctors felt that 1-3 minutes was sufficient for counselling. However, most (65.4%) nurses felt that 5-20 minutes was necessary. In fact, evidence suggests that interventions as brief as 3 minutes can significantly increase cessation rates[63]. However, in this study setting, doctors probably feel that such counselling would disrupt or prolong consultations. McCabe *et al*. demonstrated that where patients had received only five to 10 minutes of counselling and written materials, no additional staff had been necessary[54]. Success required broad institutional support, staff commitment and creative scheduling.

4.5.1 Record reviews

At the current time, there is no mine in South Africa with a formal smoking intervention policy in place. There is a paucity of literature in this area. A South African study, despite very few study subjects, compared two smoking interventions by occupational health nurses in a non-mining setting and illustrated that the preferred model was to incorporate smoking cessation as a wellness project and not during illness management[64].

In the author's experience, which is supported by evidence from this study (Table 3.7), HCWs are more inclined to determine smoking status when a patient is diagnosed with an illness and the literature also revealed that it is a common approach to give advice when there was already a medical problem[63]. Despite the knowledge of the overwhelming majority of HCWs, that patients with respiratory disease should be counselled, and despite the fact that the overwhelming majority of cases in the medical wards are respiratory cases, smoking history is not being obtained, particularly by doctors. This correlated well with high proportion of 'unknown' smoking status in the record reviews of OLD.

The high proportion of 'unknowns' among the TB cases resulted in the silicosis cases having a higher proportion of 'ever' smokers. Whether smoking status is accurately

documented, is also questionable as only one patient in the medical ward was documented as a smoker despite a high prevalence of smoking in the mining population.

Despite small numbers the results of the record reviews at the OHC showed a positive response to doctor's advice: of the workers who received advice, one worker had quit smoking and two others had reduced tobacco consumption. The record reviews also revealed that follow up of response to advice given, was poor with less than 40% of cases being followed up regarding advice given. The value of enhanced follow up of cases is well documented[57] and must form part of the HCWs smoking intervention.

Overall HCWs have demonstrated good knowledge and attitudes towards smoking in mine workers and this bodes well for smoking interventions involving these health professionals. Smoking interventions may be easily integrated into existing wellness programmes and other chronic care programmes including HIV and TB.

4.6 Limitations

1. There were no questions to check for internal validation.
2. The questionnaires were piloted amongst doctors only. While no problems were raised, it emerged later that the questions on workplace policy (31 to 3 of section 3) were ambiguous. These questions were answered in different ways by study participants, such that the results of the analysis of this component on workplace, was not reliable.
3. Constraints as to why HCWs do not perform as they would like to do were not elicited in the questionnaire.
4. Ex-smoking HCWs were not asked what strategies they used to assist themselves to quit and to continue abstinence.
5. For the record reviews, the researcher was the OMP at the study site. No records from other OMPs were reviewed; hence the extension of the record reviews to include medical ward admission records.
6. The methodology for knowledge, attitudes and practice (KAP) surveys has certain limitations, as discussed below.

KAP surveys are based on the theory that individuals' knowledge (facts), combined with their attitudes and beliefs may predict their health-related behaviours[65]. These surveys usually take the form of interviewer-administered or self-administered standardised questionnaires and information collected assists with the design, implementation and evaluation of health programmes. According to the Health Belief Model, there are some health beliefs that influence actions. A person's perceived vulnerability to a particular condition or illness; a person's perceptions of the severity or effects of the condition or

illness and their perception of the efficacy, costs and benefits of any proposed actions, will determine how they respond to questions[65].

Bias (systematic or non-random error) may be introduced if a percentage of people who should have been interviewed were not, either because they refused, or because they were not identified by the researchers[65]. In this study, the researcher has had many years of experience in the mining setting, ensuring that the quality of selection of study sample was credible. Random sampling from the study population also helps prevent bias in selection of the sample.

Reliability is the degree of consistency if the same questionnaire is administered to the same respondent at a later stage: responses should be similar, while validity depends on comparing answers on the questionnaire to an external criterion[65]. General criticisms of KAP studies are that the methodology can be flawed in terms of health phenomena in cross-cultural settings as they provide simplistic answers to complex questions about determinants of behaviour[65]. These surveys may also neglect to collect information on attitudes and beliefs that are most important to the study population due to lack of sufficient knowledge about the social and cultural conditions of that community.

Hence, insight into the demographics of the study population, will determine the design of the questionnaire so that the appropriate responses can be elicited.

CHAPTER 5: SMOKING INTERVENTION PROGRAMMES

5.1 Introduction

Smoking intervention programmes support the old adage that “prevention is better than cure” and, in the case of the mining industry, prevention is better and cheaper than compensation and the exorbitant costs of health care. Particularly when integrated with occupational health, primary health care, wellness and other out patient departments, smoking intervention programmes have the potential to enhance existing services.

5.2 Benefits of a smoking intervention programme

Smoking intervention programmes have been shown to increase both the quantity and quality of life expectancy in all smokers, and are among the most cost effective interventions available in medicine[66]. The health benefits are substantial, both immediately and in the long term. The excess risk of death from smoking falls soon after cessation and continues to do so for at least 10 to15 years[67].

Potential benefits of smoking intervention programmes in the gold mining industry:

For the individual

- Immediate and long term positive effect on overall health
- Improved quantity and quality of life
- Financial gain

For smokers’ families

- Improved quantity and quality of life
- Cleaner and safer homes
- Less household expenditure on tobacco

For the company

- Overall improvement in workers’ health
- Reduction in the rates of severity of respiratory diseases
- Productivity enhancement
- Cleaner and safer workplaces
- Compliance with company objectives
- Compliance with legislation
- Enhanced corporate image

For the community

- Lower health care expenditure
- Improved health status
- Less harm from second hand smoke
- Cleaner and safer environment
- Reduction in costs related to cleaning up after smokers

5.3 Components of a smoking intervention programme

There are two components of a smoking intervention programme. These are non – pharmacologic interventions such as brief advice, self-help material and behavioural support, and pharmacologic interventions such as nicotinic and non-nicotinic therapies.

5.3.1 Brief advice

The Cochrane Tobacco Addiction Group defines brief advice as 'verbal instructions to stop smoking with or without added information about the harmful effects of smoking'[68]. The success rate of brief advice is modest: 1 in 40, but it remains one of the most cost effective interventions in medicine.

As early as 1979 Russell *et al.* published an article in the British Medical Journal, which sparked debate[69]. They showed that simple, brief advice from a doctor, lasting at least nine minutes, would result in 5% smoking cessation rates in the long term, a huge gain for public health. More recently in 2004, Coleman in his article "Cessation interventions in routine health care" claims that smoking causes much more harm than, hypertension, for example, yet receives much less attention in terms of systematic enquiry, written protocols and guidelines[70].

The challenge for the medical community and particularly HCWs is to integrate smoking interventions into routine medical care. HCWs should adopt a methodological approach when interviewing patients and use smoking status as a 'vital sign'[70]. Smoking status should be asked at every encounter and the 5As approach[70, 71] (ask, assess, advise, assist, arrange), which is the gold standard in smoking intervention programmes, should be incorporated into smoking intervention programmes. Although long-term success rates are not maximal with the five A's approach, it remains the most cost effective.

Five "As" Approach

Ask about smoking at every opportunity

Assess smoker's interest in stopping

Advise against smoking

Assist smokers to stop

Arrange follow up

Brief simple advice from a doctor about quitting smoking, increases the likelihood that a smoker will quit and remain a non-smoker 12 months later even brief simple advice from a doctor about quitting smoking, increases the likelihood that a smoker will quit and

remain a non-smoker 12 months later even brief simple advice from a doctor about quitting smoking, increases the likelihood that a smoker will quit and remain a non-smoker 12 months later[50].The recommended strategy for giving brief advice is to keep it simple and appropriate without violating patients' privacy and rights. The HCW must remain professional, be sensitive to the individual's needs and be diplomatic, so as to gain the patient's trust. Coleman has suggested particular phrasing for giving brief advice to smokers[71].

"The best thing you can do is stop smoking, and I would advise you to do so as soon as possible"
"How do you feel about your smoking?"
"How do you feel about tackling your smoking now?"

Good record keeping is fundamental to a good smoking programme and for future monitoring and evaluation. This study shows that whilst HCWs knew that they had to document smoking status, in practice this was not done. Appendix 9 (page iii) is an example of how a smoking questionnaire can be used for purposes of good documentation.

Despite the ease with which brief advice can be incorporated, GPs do not comply for various reasons[70].

General practitioners' reasons for not giving smoking advice

- Lack of expertise
- Lack of financial incentives
- Respect for smokers' privacy
- Fear that negative message might lose customers
- Pessimism because most smokers are unable to quit

5.3.2 Self-help material

In 2006, the Cochrane review by Lancaster and Stead showed that standard self-help materials may increase quit rates compared to no intervention[72]. Giving self-help material alone had minimal benefits while tailoring materials to the individual needs was more effective. They could not find evidence to demonstrate that giving self-help materials together with other interventions, such as brief advice or medication, was more effective than these interventions alone.

5.3.3 Behavioural support

Although there is a strong case to integrate brief advice at every consultation with a smoker, more intensive counselling must be offered to those who are more motivated to quit. Meta-analysis trials have shown about one in 13 smokers who are motivated enough to attend counselling will succeed in quitting[68]. Three simple direct questions should be asked to determine motivation to quit, and a positive answer should be an indication to offer behavioural support[73].

To assess motivation (Appendix 9, page iii)

1. Do you want to you want to stop smoking for good?
2. Are you interested in making a serious attempt to stop in the future?
3. Are you interested in receiving help with your quit attempt?

Behavioural therapy involves assisting smokers to identify where they might have a weakness resulting in relapse, and to use problem-based strategies to assist them to quit. Behavioural therapy helps smokers avoid stimuli that trigger smoking, such as alcohol, "first morning" coffee, stress, and associating with other smokers. Behavioural strategies will help alter the usual smoking patterns and address the consequences of the nicotine withdrawal.

Behavioural support can be group-based (easier for the workplace setting) or individual. Not all smokers will be keen on group counselling, but for those who do attend, it is clearly beneficial[74].Individual counselling by a trained counsellor, separate from medical care, for at least 10 minutes, could also help smokers quit[75]. There is insufficient evidence to deduce that more intensive counselling is better.

5.3.4 Pharmacologic intervention

In addition to the three questions to determine motivation to quit, two simple questions should be asked to determine dependence. A "yes" response to either would suggest that the smoker might benefit from pharmacotherapy[73].

To assess dependence (Appendix 9, page iii)

1. Do you find it difficult not to smoke in situations where you would normally do so?
2. Have you tried to stop smoking for good in the past but found you could not?

The Fagerström[73] test (Appendix 9, p iv) is also used widely to measure dependency levels quantitatively. The greater the dependency, the greater the likelihood

that higher dose or combination pharmacotherapy should be used, in addition to intensive behavioural support. Several quit attempts may be required under these circumstances. Once the decision is made to stop, it is the degree of dependence and not motivation that will determine the outcome.

There are two types of pharmacological interventions, namely nicotine replacement therapy (NRT) and non-nicotinic treatment (Bupropion or Zyban). NRT is effective when smokers are motivated to quit *and* are dependant on nicotine but it should be offered to any regular smoker[76]. The most recent Cochrane reviews suggest that NRT leads to a near doubling of cessation rates achieved by non-pharmacologic interventions, regardless of the level of that intervention. NRT is the treatment of choice, but non-nicotinic drugs are also available.

Bupropion (Zyban) is the most commonly used non-nicotinic drug. Bupropion is as effective as NRT when given in combination with intensive behavioural support. Like NRT it leads to a near doubling of the smoking cessation rate, achieving long term abstinence in 19% of smokers who use it quit[77].

In 2000, Silagy *et al.* (Table 5.1), looked at the five types of NRT and Bupropion (non-nicotinic therapy) and concluded that NRT worked regardless of additional counseling[78]. However, West *et al.* showed that NRT is best used in combination with brief advice and behaviour therapy as depicted in Table 5.2 [79].

Table 5.1 Cochrane Collaboration quit rates long-term (>6 months) for various forms of nicotine replacement therapy and Bupropion[78].

TREATMENT	SMOKERS QUIT RATE (%)	PLACEBO CONTROL QUIT RATE (%)
Nicotine gum	19.7	11.5
Nicotine patch	14.4	8.4
Nicotine lozenge	17.2	8.9
Nicotine nasal spray	23.9	11.8
Nicotine inhaler	17.1	9.1
Bupropion	19.3	10.2

Table 5.2 Proportion of smokers abstaining from smoking long-term by cessation intervention[79]

INTERVENTION	LONG-TERM ABSTINENCE (%)
No intervention (will power alone)	3
Brief, opportunistic advice from doctor to stop	5
Plus NRT	10
Intensive support from specialist	10
Plus NRT	18

5.3.4.1 Pharmacotherapy in HIV/AIDS

The type of smoking cessation treatment may be complicated by the extent of HIV disease, drug interactions and side effects[37]. This choice will depend on dependence and motivation to stop, as for the HIV-seronegative person. However, researchers strongly believe that cognitive and behavioural modifications produce much larger success rates in HIV positive individuals, who may already be exposed to polypharmacy and be hesitant to use more medication. These patients may have more to gain from intensive counselling alone[1].

5.4 Summary

Smoking is one of several health issues that may be discussed in a single consultation and the basic step is to document smoking history as a 'vital sign' and give brief advice. Since only about 20% of smokers who visit general practitioners intend to quit, it makes sense to direct more intensive efforts to those smokers who are more motivated while non-motivated smokers must be encouraged to quit. HCWs should tailor their discussions to the level of motivation and dependence and the specific needs of the individual in a non-judgmental way. The combination of non-pharmacological and pharmacological interventions is multiplicative rather than additive[76] and the effectiveness increases with the intensity of the non-pharmacological intervention.

CHAPTER 6: RECOMMENDATIONS

6.1 Proposed framework for smoking intervention programme for the mines, incorporating HCW programme

The proposed framework for smoking intervention programme for the mines, incorporating HCW programme (Appendix 9)[h] depicts how such a program can provide the platform to achieve the constitutional and legal imperatives and particularly how HCWs fit into the bigger picture.

6.1.1 Introduction

SA has committed itself to the WHO's FCTC[1] and the latest Tobacco Products Control Amendment Bill (2006)[7] brings SA in line with international best practice. A formal workplace smoking policy that incorporates the proposed HCW programme (Appendix 9, page ii) is one possibility for smoking interventions on the mines to achieve the Company's objectives; workplace and community efforts will augment the efforts of HCWs. Other support structures working synergistically with HCWs will be critical success factors of such a programme.

6.1.2 Explanatory notes

Utilising HCWs as the primary means of smoking intervention will ensure that the objectives outlined in the company 'Smoking in the workplace policy' (Appendix 1) are met. Some of the objectives of such a policy are to provide employees with a healthy working environment; to identify high risk groups; to minimise the harmful effects of passive smoking on the non-smoker and to educate smokers about the harmful effects of smoking. However the objective of providing advice, guidance and support to employees who decide to give up smoking, is the most important one for HCWs to assist with.

Ongoing workplace education and awareness is vital. Comprehensive health promotion programmes incorporated into the standard procedures for routine care at the TB, HAART, wellness, occupational and primary health clinics will support the smoking policy as a whole. Appropriate training for HCWs identified as counsellors and custodians of the programme is essential. Collaboration with all stakeholders, both internally and externally, namely, employees, labour representation, mine management, NCAS, MHSC, Departments of Health and Mineral and Energy, WHO Tobacco Initiative and tertiary institutions, will bode well for the credibility and sustainability of such a programme.

[h] A practical, user friendly handout with explanatory notes has been developed for this purpose and has been inserted at the end of this document.

6.1.3 Implementation

Due to the nature of business in the mining industry, and so as not to incur added costs and create bottlenecks especially with HCWs who are already overworked, the researcher proposes a step wise, phased-in approach as outlined in the HCW programme (Appendix 9, page ii).

In phase I of proposed HCW programme (Appendix 9, p ii), smoking history must be documented as a 'vital sign' and brief advice for both smokers and non-smokers must be the mainstay of intervention. This part of the programme addresses both smokers and non-smokers as well as both motivated and unmotivated individuals. The programme incorporates the 5As approach (ask, assess, advise, assist, arrange)[70,71]. Self-help material may be offered. Findings must be recorded on a smoking questionnaire (Appendix 9, p iii) designed for this purpose or in the individual's medical record.

Phase II assesses for dependence and motivation and arranges follow-up. Two short questions determine how dependent a person is on nicotine, while three short questions assess motivation. The Fagerström test[73] (Appendix 9, p iv) may also be used as a more quantitative measure of dependence. Behavioural support is recommended if dependence on nicotine is noted and pharmacotherapy is recommended for motivated individuals. Both interventions may be offered simultaneously if required.

Phases of implementation of smoking intervention programme:

Phase I

1. Ask about smoking
2. Offer brief advice to all individuals regardless of smoking status
3. Smokers, assess whether the individual wants to stop
4. Offer self-help material
5. Record findings

Phase II

1. Assess dependency and motivation
2. Offer pharmacologic treatment where indicated
3. Offer non-pharmacologic treatment where indicated
4. Offer more intensive counselling where indicated
5. Arrange follow up
6. Record findings

6.1.4 Summary

Following preliminary findings from this research report, and after brief, informal, on the job training of HCWs on the health effects of smoking and its impact on the OLD, the researcher partially implemented phase I at the Kloof OHC, demonstrating the ease with which such a phased-in approach can be implemented. This intervention can be applied ahead of a formal workplace policy (where no such policy exists) and integrated into existing routine health care structures without additional resources.

6.2 Other recommendations

The recommendations that follow require more networking and coordinating before the HCW program can benefit from these actions, but they are nevertheless value-adding and vital.

6.2.1 Training

Tertiary institutions must be approached to incorporate formal smoking cessation training programmes and treatment of tobacco dependence as a chronic disease. It must be integrated into the undergraduate training curricula for nursing, medical and paramedical students.

Formal training for the HCWs must be developed and initiated, but the value of informal training on health effects of smoking and smoking cessation techniques must not be underestimated. Subsequent to the preliminary findings, the researcher has embarked on in-service training of nurses. This informal training and education appeared to have a positive impact on the quality of smoking information obtained and advice given, to both patients who smoke and those who do not smoke and will be assessed after a period of one year. The emphasis must be on simple training that is appropriate and practical.

6.2.2 High risk groups

Identifying and targeting high risk groups such as newly employed workers (especially young non-smokers), employees with existing respiratory disease, as well as TB and HIV control programmes, is an important part of such a programme. Routine care at primary, secondary and occupational health clinics must incorporate smoking interventions in their standard procedures.

6.2.3 Support for HCWs

HCWs who wish to quit smoking must be assisted to do so, to enable them to be the role models they aspire to be. HCWs expressing a desire to be involved with smoking interventions must be encouraged to do so, with a clear development plan that supports

the growth of the individual. Comprehensive health promotion programmes must incorporate principles of smoking interventions, so that HCWs can apply their knowledge more holistically in different departments of the health service and on the mines.

6.2.4 Record keeping

Good record keeping and follow up of cases is critical. A smoking questionnaire has been designed for this purpose (Appendix 9, p iii) but is optional; alternatively documentation must accompany or reside within routine medical notes.

6.2.5 Research

This intervention, once implemented must be monitored and evaluated continuously to determine effectiveness and impact. The significant differences between doctors' and nurses' KAPs must be further explored to enhance the programme.

It is not known if responses to advice given to patients regarding smoking may differ based on gender of the counsellor. Since males constitute a higher proportion of nursing staff in this setting, and since most patients in this setting are male, more research is warranted to determine if these patients may be more receptive to advice from male nurses.

Collaboration with internal and external stakeholders such as WHO, NCAS and MHSC must guide current interventions and future research.

CHAPTER 7: CONCLUSION

Overall, HCWS are responsive to workplace smoking interventions: they are knowledgeable, and show insight and have positive attitudes towards smoking interventions, but a more enabling environment is required to establish good workplace practices. To this end a “Proposed framework for smoking interventions on the mines, incorporating the HCW programme” has been developed and partially implemented. Awareness of this study and its preliminary findings has already demonstrated a paradigm shift in thinking about tobacco on the gold mines.

With HCWs as the primary means of smoking intervention, the company’s strategic focus on employee well-being and health promotion can be realized whilst simultaneously addressing the broader public health priorities that challenge the mining industry.

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APPENDIX 1 Gold Fields “Smoking in the workplace policy” 2004

Human Resources

Policy Manual

South African Operations

SECTION f

EMPLOYEE RELATIONS

F11
SMOKING IN THE WORKPLACE

Initial Approval by EXCO – 14 October 2003

EFFECTIVE DATE:	1 November 2004
REVISION NUMBER:	Initial
REVIEW DATE:	August 2005

'It is specifically provided that the company's policies, practices and procedures do not in themselves constitute terms and conditions of employment but flexible guidelines designed to ensure the company's compliance with fair labour and accepted industrial relations practices.'

Policy: F11

SMOKING IN THE WORKPLACE

Scope of Policy:

The principles of the policy apply to all employees at all Group operations, service organisations and in corporate office, as well as to clients, customers and vendors visiting the company. The policy will be implemented in line with *The Tobacco Products Control Act 83 of 1993* and the *Tobacco Products Control Amendment Act 12 of 1999.*

Strategic Linkage:

The policy contributes towards the Group's strategic focus on employee well-being. The company acknowledges the need to restrict smoking in the workplace for medical, safety, legal and financial reasons. The company further recognises the health effects of passive smoking, the need to manage the risk of liability from disease caused by passive smoking, and the need to encourage the cessation of smoking as part of health promotion in the workplace.

The objectives of the Group, which are supported by this policy are:

- to provide employees with a healthy working environment;
- to minimise the harmful effects of passive smoking on the non-smoker;
- to educate smokers about the harmful effects of smoking;
- to provide advice, guidance and support to employees who decide to give up smoking;
- to establish procedures and rules that will regulate smoking in the workplace.

The principles of the policy apply to all employees at all levels, as well as to clients, customers and vendors visiting the company. Failure to comply with the law may result in the company and employee being found guilty of an offence and liable to conviction or a substantial fine, or both.

(Reference 1 – Human Resources Strategic Plan)

Policy and Principle Guidelines:

The following policy and principle guidelines will apply to *smoking in the workplace*:

1. The company subscribes to compliance with the Tobacco Products Control Act and Tobacco Products Control Amendment Act and will ensure that necessary provisions and mechanisms are put in place.

• Employees who do not wish to be exposed to tobacco smoke in the workplace will be protected from smoke and employees who object to tobacco smoke in the workplace will not be subjected to retaliation of any kind.

• The Act prohibits smoking in public places. Public places are defined in the Act as any indoor or enclosed area which is open to the public or any part of the public and includes workplaces - with the exception of designated smoking areas. Accordingly, smoking is prohibited in the workplace unless in a designated smoking area. • Employees are required to refrain from smoking when dealing with the company's clients, suppliers or the general public in the conduct of company business. • For safety reasons, smoking underground is prohibited. Smoking underground constitutes a summary dismissible offence. • The Act acknowledges that tobacco use is a fairly accepted practice amongst adults, which makes it inappropriate to ban completely. • Recognising the difficulty of controlling the release of secondary smoke into the air, smoking outside of designated smoking areas in the workplace is prohibited. The designated smoking area must not exceed 25% of the total floor space of the workplace. • Ventilation of the designated smoking area must be such that air from the area is directly exhausted to the outside and is not re-circulated to any other area within the workplace. • The designated smoking area(s) must be separated from the rest of the workplace by a solid partition and an entrance door on which the sign '*Smoking Area'* is displayed. In addition, the following message may be displayed at the entrance to the facility: *"Smoking of tobacco products is harmful to your health and the health of children, pregnant or breastfeeding women and non-smokers".* • Employees may not convert their offices into smoking areas but must use the smoking areas designated by the company. • The company accepts that employees who smoke may, where possible, leave their workstations at intervals during the working day for a "smoke-break". It is the responsibility of employees who smoke and their immediate managers to ensure that such "smoke-breaks" do not negatively affect productivity. A smoker must actively monitor time spent on "smoke-breaks" and ensure that such breaks are not abused and are not overly time-consuming. Prolonged and frequent absences may warrant disciplinary action being taken against the employee in terms of the Company's disciplinary procedure.	
References	*2 – The Tobacco Products Control and Amendment Acts; 3 – Policy and Procedures on Management of Substance Abuse; 4 – Gold Fields Ethics Policy*

2. The company's policy and procedures set out herein require the co-operation and support of the employees of the company. Conduct that is contrary to this policy might carry consequences as outlined below.

• All employees share a responsibility for ensuring that the policy is properly implemented and adhered to. • Smoking in a non-designated area will constitute misconduct, which may lead to disciplinary action in terms of the Company's disciplinary procedure. Continued and unwarranted infringements of the policy will, after warnings, warrant dismissal.

• The unauthorised removal or defacing of any signage in the workplace indicating where smoking is or is not permitted will also constitute misconduct that may invoke disciplinary action.	
References	*5 – Policy and Procedures on Disciplinary Action; 6 – Company Disciplinary Procedure*

3. The company will undertake appropriate education regarding its policy and procedures on smoking and the harmful effects of smoking.

• During induction and annual refresher training, and/or alternatively through whatever communication channels are deemed appropriate by management, employees must be provided with information on: – the company's policy and procedures regarding smoking; – the effects of smoking on health; and – ways of stopping smoking.	
References	*7 – Policy and Procedures on Induction, Orientation and Refresher Programmes*

Human Resources Policy Manual Cross-References		
Reference	**Section**	**Title**
1	-	Human Resources Strategic Plan
2	-	The Tobacco Products Control and Amendment Acts
3	G	Policy and Procedures on Management of Substance Abuse
4	-	Gold Fields Ethics Policy
5	F	Policy and Procedures on Disciplinary Action
6	-	Company Disciplinary Procedure
7	A	Policy and Procedures on Induction, Orientation and Refresher Programmes

APPENDIX 2 Health care workers' questionnaire

Study no._____

This is a survey, undertaken by Vanessa Govender for a Master of Public Health degree with the Faculty of Health Sciences, School of Public Health, University of Witwatersrand. All information will be anonymous and will be treated as strictly confidential. Please read the information sheet. Your name is not required. Participation is voluntary It is important that we get correct answers. Please think carefully before answering the questions.

To fill in the questionnaire, **please ring** the appropriate answer or write your answer in the space provided.

Date: _____

Section 1: Demographics						
1	What is your gender?	1. Female	2. Male			
2	What is your age?	Age_____				
3	What is your profession?	1.Doctor	2. Nurse			
4	What is your highest professional qualification?	1. Degree 2. Diploma 3. Certificate				
5	How many years in the mining industry?	Years____				
6	Are you a smoker?	Yes	No			
7	Are you an ex-smoker?	Yes	No			
Section 2: Knowledge and Attitudes						
	Check appropriate box	*1. Strongly*	*2.Agree*	*3.Unsure*	*4.Disagree*	*5.Strongly Disagree*
7	Smoking is harmful to your health					
8	Health professionals serve as role models to their patients and the public					
9	Patient's chances of quitting are increased if a health professional advises him or her to quit					
10	Health professionals should routinely ask about their patients' smoking habits					
11	Health professionals should routinely advise their smoking patients to quit					
12	Health professionals should routinely advise all patients with known respiratory diseases to quit					
13	Smoking should be managed like any other chronic disease					

	Check appropriate box	*1. Strongly agree*	*2. Agree*	*3.Unsure*	*4.Disagree*	*5. Strongly disagree*
14	Doctors and nurses are adequately trained to help patients to quit smoking					
15	Health professionals should get specific training on cessation techniques					
16	I would like to be involved in a smoking cessation program at the workplace					
17	I would like to belong to an anti-tobacco organisation					
18	I think smoking is addictive					

19. What percentage of mine workers, would you estimate, currently smoke cigarettes?
1-20%____ 21-40%_____ 41-60%_____ over60%_____

	Check appropriate box	*1. Strongly*	*2.Agree*	*3.Unsure*	*4.Disagree*	*5.Strongly Disagree*
20	Mine workers' smoking prevalence is higher than for the general population					
21	Smoking is harmful to the health of mine workers					
22	Tobacco use predisposes mine workers to acquiring lung diseases					
23	All mine workers should be routinely advised to quit smoking					
24	Newly engaged non-smoking workers should be advised never to start smoking					
25	Newly engaged smoking workers should be advised to stop smoking					
26	Mine workers smoking status should be routinely documented					
27	Smoking increases mine workers risk of mine accidents					
28	Smoking results in more illness thereby decreasing productivity at the workplace					

29 *Compared to the general population, do you believe that smoking in mine workers increases their risk of acquiring occupational lung diseases such as?*

a) Lung cancer 1. Yes 2. No
b) TB 1. Yes 2. No
c) Silicosis 1. Yes 2. No
d) Chronic Obstructive Airways Disease (COPD) 1. Yes 2. No

30 Do you believe that to acquire any of the above diseases one would have to smoke?

A lot / little / not at all / don't know

Section 3 Workplace practice	
31	What sort of smoke-free policy is in place at your workplace? 1. No smoking policy in place Go to 34 2. Smoking rooms available Go to 33 3. No smoking rooms allowed at all on the premises Go to 33
32	Is the smoke – free policy enforced? 1.Yes: always 2. Yes: sometimes 3.No 4.Don't know
33	Do you routinely ask the smoking status of clients/ patients and note it on the record? 1.Yes: always 2. Yes: sometimes 3.No 4.Don't know
34	Are the following interventions AVAILABLE to YOU to help your patients stop smoking? a) Traditional remedies 1. Yes 2. No b) Self-help material 1. Yes 2. No c) Counselling 1. Yes 2. No d) Medication (nicotine gum, patch) 1. Yes 2. No e) Other (specify) _____
35	How well prepared do you feel you are when counselling patients on how to stop cigarette smoking? 1. Very well prepared 2. Somewhat prepared 3. Not at all prepared
36	Have you ever received any formal training in smoking cessation approaches to use with your patients a) Formal training during medical school or nursing college 1.Yes 2.No b) Formal training during specialization programs 1.Yes 2.No c) Special conferences, workshops 1.Yes 2.No
37	Do you routinely counsel patients against smoking if: 1. You are aware that they have lung disease? 1. Yes 2. No 2. You know that they smoke? 1. Yes 2. No 4. You know that they do not smoke? 1. Yes 2. No 5. They have a lifestyle disease such as Hypertension or Diabetes? 1. Yes 2. No
38	What amount of time per consultation do you think a health care worker needs to advise patients to stop smoking? a.1 – 5 minutes b. 5 – 10 mins c.10 – 20 mins d. More? Please specify _____

39	What could the mines do to support their workers in reducing smoking?
40	What could health care workers do, in their routine practice, to assist mine workers in reducing smoking?

Thank you for your participation
If you need more information regarding tobacco use contact the National Council against Smoking at 011 720 3145

APPENDIX 3 Data collection sheet for record review

VISIT NUMBER 1
Date of Attendance at OHC: _____
Diagnosis: TB COAD Silicosis Occupational Asthma Other Date of Diagnosis: _____
Smoking status: Current Smoker Never smoked Ex smoker
Advised to stop smoking? Yes No Date of Advice: _____

VISIT NUMBER 2
Date of Attendance at OHC: _____
Response to advice? Stopped smoking Still smoking, reduction in tobacco use Still smoking, no reduction in tobacco use

VISIT NUMBER 3
Date of Attendance at OHC: _____
Response to advice? Stopped smoking Still smoking, reduction in tobacco use Still smoking, no reduction in tobacco use

APPENDIX 4 Revised Data collection sheet for record review

VISIT NUMBER 1
Date of Attendance at OHC: _____
Diagnosis: □TB □COAD □Silicosis □Occupational Asthma □Other Date of Diagnosis: _____
Smoking status □ Unknown (not asked) □ Current Smoker □ Never smoked □ Ex smoker Previously Documented? □Yes □ No If "Yes", date previously documented _____ □ Current smoker □ Never smoked □ Ex Smoker
Advised to stop smoking? □Yes □ No □ N/A Date of Advice: _____ Advised never to start smoking? □Yes □ No □ N/A Date of advice: _____

VISIT NUMBER 2
Date of Attendance at OHC: _____
Response to advice? □ Stopped smoking □ Still smoking, reduction in tobacco use □ Still smoking, no reduction in tobacco use □ Not asked

VISIT NUMBER 3
Date of Attendance at OHC: _____
Response to advice? □ Stopped smoking □ Still smoking, reduction in tobacco use □ Still smoking, no reduction in tobacco use □ Not asked

APPENDIX 5 Data collection sheet for record reviews: medical ward admissions

Data collection sheet for record reviews: medical ward admissions						
		Smoking history documented				
		Doctor		Nurse		
Number	Diagnosis	Yes	No	Yes	No	Comments
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
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20						
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22						
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27						
28						
29						
30						

APPENDIX 6 Information sheet

Good Day,

I am Dr Vanessa Govender, an Occupational Medical Practitioner at the Kloof Gold Mine in Westonaria. As a part-time student at the School of Public Health, University of Witwatersrand, and as part fulfilment of the requirements towards the Master of Public Health Degree, I am undertaking a study investigating health care workers' (doctors and nurses) knowledge, attitudes and practices regarding smoking in mineworkers and the opportunities for smoking cessation programs on the mines.

Why am I doing this?
South Africa's death statistics shows that more than 20 000 deaths per year are attributed to smoking. Lung diseases cost the mine significantly in terms of compensation, medical treatment, disability, premature deaths and lost production due to illness. Few medical interventions are as cost effective as smoking cessation programs. For relatively modest expenditure and resources, long-term health costs can be reduced, whilst simultaneously enhancing the workers' general health and well-being.

What is expected of the participants?
You will be expected to complete a self-administered questionnaire that will take approximately 15 minutes to complete. The first section will deal with your demographic information. Section 2 deals with your knowledge and attitudes about smoking, and lastly workplace practices and your views about how we can address this problem will be requested.

Are there benefits to the participants?
As a health care worker your participation in this research will have long lasting rewards.

It is envisaged that this research will lead to a program being implemented that can holistically address your and your patients' needs.

May I withdraw from the study?
Certainly, you may withdraw at any time by not completing the whole questionnaire. Your response will be anonymous and you will not be victimized in any way by not participating or leaving out any of the answers.

What about confidentiality?
Anonymity and confidentiality will be maintained at all times. No names are required at any stage during the research. The study number will not be linked back to you as the participant. The results will be presented in a grouped format so that no individual can be identified and the results will be made available to you after the study.

If you have any queries, more information may be obtained from myself at 011 - 411 8546.

I am hereby inviting you to participate in this study. Should you wish to participate, please complete the questionnaire and post it in the anonymous box designated for this purpose at your Human Resources Department. The research has been approved by the Committee for Research on Human Subjects (Medical) at the University of the Witwatersrand and the Chairman can be contacted for any queries at 011 7171234.

Thank you
Dr Vanessa Govender

APPENDIX 7: Letter of permission from Gold Fields Health Services

Dr V Govender
Occupational Medical Practitioner
Kloof Occupational Health Centre

4 July 2005

Dear Dr Govender

LETTER OF PERMISSION

Permission is hereby granted for you to embark on a study investigating health care workers' (doctors and nurses) knowledge, attitudes and practices concerning smoking in mineworkers and to further explore opportunities for smoking cessation programs on the mines, as envisaged in your e-mailed letter dated 29 June 2005 (*copy attached).

Yours faithfully

Dr RWP Verster
MBChB DTM&H DPH DHSM DOH
Snr Manager Health

*Attachment

cc: GFH Exco
Dr R Hansia

APPENDIX 8 Ethical clearance

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Govender

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M050723**
PROJECT	HealthCare Workers' Knowledge, Attitudes and Practices Regarding Prevention of Smoking in Mineworkers
INVESTIGATORS	Dr VG Govender
DEPARTMENT	School of Public Health
DATE CONSIDERED	05.07.29
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 05.08.05 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Prof M Ross

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX 9 Proposed framework for smoking intervention programme on the mines, incorporating health care worker programme

World Health Organisation

- Framework Convention on Tobacco Control (Article 8: Protection from exposure to tobacco smoke)
- Code of Practice for Tobacco Control in Health Professional organisations

Legislation: Tobacco Products Control Amendment Act

Objectives

- Prevention / Protection / Intervention

Policy: "Smoking in the workplace"

Objectives

- Provide healthy working environment
- Identify high risk workers
- Minimise harm due to secondary smoke
- Provide guidance, support, advice
- Education regarding harmful effects of smoking

Programme: Smoking intervention

Objectives

- Assistance with quitting
- Prevention

Proposed HCW programme

Support structures

Workplace interventions

- Standard procedures in routine health care
- Health promotion programme
- Workplace education and awareness
- Training of counsellors

Internal stakeholders

- Mine management
- Unions
- GFBLA*

Community-based interventions

External stakeholders

- MHSC*
- NCAS*
- WHO*
- Tertiary institutions
- Departments of Health, Mineral and Energy, Labour

*GFBLA: Gold Fields Business and Leadership Academy or company equivalent. MHSC: Mine Health and Safety Council. NCAS: National Council Against Smoking. WHO: World Health Organisation

Proposed Health Care Worker Programme

PHASE I

ASK *(smoking as a 'vital sign')* — **Do you smoke?**

- Yes
- No/Ex-smoker

ASSESS

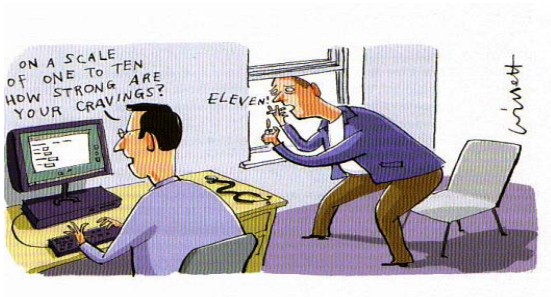
- Would you like to stop?
- Advise not to start

- Yes
- No

ADVISE

- Offer brief advice
- Offer brief support

(Document findings: smoking questionnaire)



ASSIST — Offer self-help material

PHASE II

ARRANGE — Arrange follow-up

ASSIST — Refer counsellor and / or

Assess dependence[i]

1. Do you find it difficult not to smoke in circumstances where you would normally do so?
2. Have you ever tried to stop smoking in the past but found you could not?

Assess motivation

1. Do you want to you want to stop smoking for good?
2. Are you interested in making a serious attempt to stop in the future?
3. Are you interested in receiving help with your quit attempt?

ASSIST

- Offer behavioural support
  - Group
  - Individual
- Offer pharmacotherapy

ARRANGE — Follow-up

(Document findings: smoking questionnaire)

[i] When assessing dependence and motivation, a positive response should be an indication to offer an intervention. The Fagerström test can also be used to quantitatively assess dependence.

Smoking questionnaire

Name					
Industry		**Date**			
Smoker?	Yes		No		
Ex-smoker?	Yes		No		
Number smoked per day?	Number of years smoking?		Number of pack years?		
Occupational lung disease – past/present?	Yes	No	Not applicable		
If 'yes', specify	Silicosis	COAD	TB	Lung cancer	Other
Smoking related disease?	Yes	No	Not applicable		
If 'yes', specify	Cardiovascular	Respiratory	Cancer	Other	
Would you like to stop?	Yes	No	Not applicable		
Brief advice given (non/ex smokers included)	Yes	No	Not applicable		
Self-help material offered?	Yes	No	Not applicable		
Dependent?	a. Do you find it difficult not to smoke in circumstances where you would normally do so? Yes/No	b. Have you ever tried to stop smoking in the past but found you could not? Yes/No			
Fagerström score					
Motivated to stop?	a. Do you want to you want to stop smoking for good? Yes/No	b. Are you interested in making a serious attempt to stop in the future? Yes/No	c. Are you interested in receiving help with your quit attempt? Yes/No		
NRT prescribed / recommended?	Yes	No	Not applicable		
Bupropion prescribed/recommended?	Yes	No	Not applicable		
Behavioural support offered?	Yes	No	Not applicable		
Follow up date given?	Yes	No	Not applicable		
COMMENTS					
Name and signature of counsellor:		**Date:**			

Fagerström test for nicotine dependency: a quantitative index of dependence		
Q1. How many cigarettes per day do you usually smoke? (Write a number in the box and circle one response)	10 or less 11 – 20 21 – 30 > 31	0 1 2 3
Q2. How soon after you wake do you smoke your first cigarette? (Circle one response)	Within 5 minutes 6 – 30 minutes > 31 minutes	3 2 0
Q3. Do you find it difficult to stop smoking in non-smoking areas, for example in church, cinema, bus? (Circle one response)	No Yes	0 1
Q4. Which cigarette would you most hate to give up? (Circle one response)	First of the morning Other	1 0
Q5. Do you smoke most frequently in the first hours after waking than the rest of the day? (Circle one response)	No Yes	0 1
Q6. Do you smoke even if you are so sick that you are in bed most of the day	No Yes	0 1
Total score =		

Interpretation: *the numbers correspond to smoker's responses. Added together, they produce a single score on a scale of 0 (low dependence) to 10 (high dependence). Smokers in the general population score, on average, 4. Of all the items listed, the first two questions are the most important in determining dependence.*

Explanatory Notes:

South Africa (SA) has committed itself to the World Health Organisation's Framework Convention on Tobacco Control and the latest Tobacco Products Control Amendment Bill (2006) helps bring SA in line with international best practice. The proposed framework for smoking intervention programme for the mines (page i), incorporating a health care worker (HCW) programme (page ii) depicts how such programmes can provide the platform to achieve legal imperatives. A formal workplace smoking policy that incorporates the proposed HCW programme is one possibility for smoking interventions on the mines and other workplaces; but support from the workplace, community and other stakeholders will augment the efforts of HCWs. A step wise, phased-in approach as outlined in the HCW programme (p ii) is recommended and can be implemented at minimal extra cost.

Phase I of the proposed HCW programme (page ii), emphasises that smoking history must be documented as a 'vital sign'. Brief advice and self-help material[j] must be offered where indicated. The programme incorporates the 5A's approach (ask, assess, advise, assist, arrange). Information obtained and advice given must be documented in the smoking questionnaire (page iii) designed for this purpose.

Phase II involves evaluating for dependence (Fagerström test may be used) and motivation and arranging follow-up. Behavioural support is recommended if the individual is dependent on nicotine and pharmacotherapy for more motivated individuals. Both interventions may be offered simultaneously if required.

[j] Self-help material may be acquired from the National Council Against Smoking