Ethical Management of Gold Mine Workers with Early and Mild Silicosis in South Africa

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Submitted to the Faculty of Health Sciences, University of Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree Masters of Science in Medicine in Bioethics and Health Law

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Date: 24/11/2022

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Figure	Implications /Definitions
0.1m3//mg OEL	Current South African silicosis occupational exposure limit
0.5m3/mg OEL	Target South African Silicosis occupational exposure limit
ILO 0/0	No Silicosis on X-Ray
ILO 0/1	Early Silicosis
ILO 1/1	Mild Silicosis OLD < 10%
ILO 1/2	Moderate Silicosis > 10% / also applies for severe forms
ILO 2/2 and beyond	Severe silicosis > 40% /also applies for mild forms
FEV 1 > 65%	No lung impairment
FEV 1 : 65- 52	Mild lung impairment
FEV1 < 52%	Severe Lung Impairment

ii. List of Acronyms

Acronym	Definition
CCOD	Compensation Compensation of Occupational Disease
COPD	Chronic Obstructive Airways Disease
FEV 1	Forced Expiratory volume
HIV	Human Immuno Deficiency Virus
IAR	International Agency for research on cancer
ILO	International Labour Organisation
ILO P,Q,R	ILO sizes of silicosis nodules
MCSA	Mineral Council of South Africa
MHSA	Mine Health and Safety Act
NHI	National Health insurance
ODMWA	Occupational Disease in Mine and Works Act
OMP	Occupational Medical Practitioners
TB	Tuberculosis
OHASA	Occupational Health and Safety Health
PMF	Progressive massive fibrosis

iii. Dedication

I dedicate this academic work to all South African gold mineworkers, ex- mine workers, the deceased mineworkers and their families. To them I would like to say thank you for your hard work**.**

iv) Acknowledgements

To Professor Kevin Behrens, the Director of the Steve Biko Centre for Bioethics at the University of Witwatersrand, for introducing the subject of Bioethics to me. It was not easy switching from scientific evidence to critical thinking, especially during the COVID-19 lockdown.

To my supervisor, Dr Cornelius Ewuoso for taking an interest in my project and making a concerted effort to learn more about the mining industry in-depth. For patiently walking with me through every milestone of the project development. Patiently encouraging me when I was discouraged. Pulling me up when I was down. It was not an easy road, but a road worth walking.

To my 3 children, Refz, Tebz and Thatz, for making my life whole and encouraging me to carry on. A word of gratitude to my husband, Dr Peter Mashabela, for his support and willingness to take the baton and fill the gaps where I could not.

I also thank God for my mother, Agnes, a pillar of strength and support for my family and me, and my late dad for his unconditional love and encouragement.

Last but not least, to God Almighty, for life, sustenance, wisdom and all.

v) Abstract

The South African Gold Mining industry is an inherently risky working environment, with frequent accidents and crystalline silica dust exposure that causes silicosis and other cardiorespiratory and autoimmune complications. These diseases can considerably impact the gold mining industry and potentially lead to public health disasters by exacerbating existing tuberculosis (TB) burden in communities and the public health sector. It is of utmost importance to control silica dust exposure and to protect mineworkers from the impact of silicosis.

In this study, I interrogate the morality of issuing certificates of fitness to already affected mineworkers to continue risk work underground where they are further exposed to silica dust, which leads to accelerated progression of their illness and its complications. Specifically, the study defends the thesis statement that mineworkers with early and mild silicosis ought not to be certified to continue risk work underground in the gold mining environment where they are further exposed to silica dust. A normative principle derived from the combination of key principles in welfarism and Afro -communitarian solidarity was used to defend the claim**.**

This mostly evaluative study – that draws on desktop-based research – outlines many recommendations, including a revision of Occupational Diseases of Mines and Works Act ODMWA (given that the Act is insufficient and not adequately inclusive), continuous evaluation, monitoring and improvement of control processes to mitigate the impact of silica dust exposure and silicosis and alternative reasonable accommodation of mineworkers with silicosis to protect them from further exposure to silica dust.

Chapter 1

1.1 Introduction

The South African Gold Mining industry is an inherently risky working environment, with frequent accidents and crystalline silica dust exposure that causes silicosis and other cardiorespiratory and autoimmune complications: chronic obstructive airways disease (COPD), scleroderma, lung cancer and cor-pulmonale. In 1996, silica was classified by the International Agency for Research on Cancer (IAR) as a human carcinogen (clas1s I) (Sherson, 2002, p. 721). Churchill and colleagues once reported an average 18-20% frequency of silicosis in South African gold miners, with a mean age of 46,7 years and an average length of risk-exposure service of 21,8 years. However, an increase to 24% frequency of silicosis has since been reported (Girdler-Brown et al., 2008, p. 645).

Besides silicosis, the rate of pulmonary tuberculosis in the South African gold mining industry is also high, with a risk of infection amongst miners higher than that of the general population (Ehrlich et al., 2021, p. 15). This risk factor is as high as 2500-3000 per 100 000 people, which is higher than in other occupations worldwide (Stewart 2020, p. 1157).

Mycobacterium (TB) infection has been exacerbated by the human immunodeficiency virus HIV pandemic that has ravaged the country in the 1990's, and continues to be a key health concern in the country. The mining industry in South Africa relies on migrant labourers from neighbouring countries and rural areas. It has been shown that these mineworkers tend to have a higher risk of acquiring HIV infection than their non-migrant colleagues (Corbett et al., 2000, p. 2760). An HIV prevalence of 27%

was recorded among gold miners attending routine examinations in 2000–2001 (Knight, et al., 2015, p. 7)**.** Both silicosis and HIV increase the risk of TB infection (Corbett, et al., 2000, p. 2759), with the relative risk of pulmonary tuberculosis in miners (and ex- miners) affected by silicosis estimated to be >2,5 (Ehrlich et al., 2021, p. 13). The case fatality rate and the risk of TB of those with silicosis are 13,4 times higher than those without the disease. Pulmonary TB is three times higher in those with silicosis than in non-silicotic miners (Ehrlich et al., 2021, p. 15).

These diseases can considerably impact the gold mining industry and potentially lead to public health disasters (Stewart, 2020, p. 1157). For instance, pulmonary tuberculosis is a highly contagious disease. Overcrowding and compact living conditions of mineworkers can increase tuberculosis spread and exacerbate the already existing TB burden in communities, negatively impacting the country's already overburdened healthcare system. Hence prevention of silicosis caused by crystalline silica dust exposure or delaying progression of the disease is of paramount importance in improving the lives and livelihoods of gold miners, their families, and communities. 1 There is therefore an urgent need to lower the current Occupational Exposure Levels (OEL) in the gold mining industry to below 0.1m3/mg1

The South African mining tripartite stakeholders - which consists of the government, industry employers, and the mineworkers' unions – convened a health summit in 2003. A resolution was made to set targets and milestones that would lead to the elimination of silicosis and other industry-specific issues like mining accidents.

[1]Relative risk of >2,5 implies that miners with silicosis have a 2,5 times risk of contracting Pulmonary TB than miners with no silicosis and the general population.

The set ambition was to bring down occupational exposure levels to 95% of the current levels of 0,1m3/mg by December 2008 and eliminate new silicosis cases in miners entering the industry after 2008 (Hermanus, 2007, p. 535). A further target aims to reduce 95% of the OEL to 0,05 m 3 / mg by 2024 (Brouwer and Rees, 2020, p. 1). Scholars believe these targets are not likely achievable (Brouwer and Rees, 2020, p. 1). Stucker and co-authors report two main factors contributing to delays and lack of incentives in the reduction of OEL.

They include the expendable nature of migrant labour systems and the need to maximise mining shareholder profits (Stuckler et al., 2013, p. 641). Mechanization and automation practised in first world countries like Australia might be costly for developing economies like South Africa to employ (Hermanus, 2007, p. 532). Resistance from unions to replace the workforce with robotics might also be an issue, given the current rate of unemployment in South Africa. There appears to have since been a decline in new silicosis cases. However, scholars continue to believe that this may be due to underreporting and under-diagnosis rather than silicosis elimination (Brouwer and Rees, 2020, p 1).

The South African government has undertaken other actions to reduce silicosis exposure. These include the promulgation of legislations and Acts to address occupational health in the South African mining industry. Examples of Acts governing the health and safety of miners in South Africa are the Mine Health and Safety Act (MHSA) and the Occupational Health and Safety Act (OHSA), and the Occupational Diseases of Mine and Works Act (ODMWA). MHSA and ODMWA are concerned with ensuring that the gold mine employers provide a conducive and safe working

environment for their employees. They equally ensure that a risk and hazard assessment is undertaken to understand exposure levels and put in place control measures to mitigate exposure to silica dust.

These Acts both mandate employers to continuously monitor safety measures and provide training for employees on self-protection, self-reporting, the right to refuse to work in dangerous environments, and, more importantly, compensation for exposure (Hermanus, 2007). 2

In the gold mining industry, silicosis is compensable under ODMWA, depending on the disease grading. First and second-degree silicosis are compensable according to the Act. Early and mild silicosis are not compensable. Those diagnosed with non-compensable diseases are expected to continue risk work3 underground, where they are further exposed to silica dust. Alternative accommodation, if available would be offered to first degree silicotics. Miners with second degree silicosis are fully compensated and totally prohibited to continue risk work underground. TB is also a compensable disease under ODMWA.

Occupational Medical Practitioners (OMPs) have a crucial role to play in limiting further risks to already affected mineworkers and the workers' fitness to continue risk work underground. They do this by issuing a certificate of fitness after medical surveillance. Miners with early and mild silicosis are often issued certificates of fitness

[2] The current OEL, 0,1mg/m^3 being the current acceptable level of silica dust exposure limits imply that the likely risk of developing early and mild silicosis remain higher than if the OEL was to be lowered to 0,05mg/m^3

[3] "Risk work" whereby the Minister declares risk work if he/she is satisfied that workers are at "risk" of contracting a compensatable disease as contemplated in ODMWA definitions. According to section 13(2) risk work means any work declared or deemed to have been declared risk work under section 13 (ODMWA)

to continue risk work underground, where they are further exposed to silica dust. Many miners with early silicosis, International Labour organization (ILO 0/1) and mild silicosis (ILO 1/1) also prefer going back to work for several reasons. 4 High unemployment rates, unavailability of reasonable accommodation on the surface, poverty, and poor social grant services in South Africa are the main drivers for mineworkers opting to return to risky work underground, where the progression of silicosis is accelerated. Other factors like low compensation and better wages equally account for the decision by mineworkers to continue risk work underground despite risks of continued exposure to silica dust. This is problematic.

1.2 Literature Overview

Silicosis is an incurable, progressive and irreversible disease-causing lung impairment. Currently, no known legislation prohibits gold mineworkers with early and mild silicosis to continue working underground. Existing studies on OEL have explored the health outcomes of silica dust exposure in underground gold mineworkers, its propensity to predispose mineworkers to silicosis, and the associated increased risk of TB, which is compounded by the high rate of HIV infection in South Africa (Stewart, 2020, p. 1158). Other studies describe the risk of TB in Silica dust exposure in South Africa (teWaternaude et al., 2006, p. 185), and silicosis prevalence and exposure-response relation in South African gold miners (Churchyard et al., 2004). (The higher the levels of silica dust one is exposed to, the higher the risk of developing silicosis

[4] ILO (international Labour organization) classifies silicosis into the following: 0/0; no silicosis; 0/1, early silicosis; 1/1, mild silicosis; and anything from 2-3 being moderate and severe). The radiological readings of mild and early silicosis show fewer silicotic nodules with no lung destruction or impairment than those found in first and second degree silicosis . The risk of pulmonary TB remains equally high in silicotics even in the absence of radiological silicosis.

over a short period of time, the longer the period one is exposed the higher the risk of developing the disease). The association of silica dust exposure and TB infection even in the absence of radiological silicosis was explored by Ehrlich and colleagues (Ehrlich et al., 2021, p. 2).

Some studies have also reported the triple disease burden of Silicosis, TB and HIV on the labour-sending communities (communities where mineworkers are sourced or hired) in rural South Africa and neighbouring countries. The burden of silicosis, pulmonary tuberculosis and chronic obstructive pulmonary disease (COPD was reported in a study of South African ex-gold mineworkers in Lesotho, after the termination of work back to their labour sending villages, with no resources for follow up or continuity of healthcare (Girdler-Brown et al., 2008, p. 644). A similar study was done in the Eastern Cape and in Botswana, where silicosis and TB were underestimated owing to a lack of resources, lack of follow up and poor local health facilities. As a result, many affected ex-miners were not compensated, died of silicosis and TB, or infected others – thereby burdening poorly resourced communities (Steen et al., 1997, p. 24).

Some studies have also explored ethical issues regarding risky work underground. As an example, some authors, Humby in 2014, Mark in 2006 and Stuckler in 2013, have explored the morality of employing migrant black miners to work underground and addressed associated questions regarding exploitation and unjust compensation, which such practices give rise to (Humby, 2014, p. 660) (Stuckler, 2013, p. 641). Other studies have focused on the ethical issues of racial inequalities of the past, unethical labour practices in the gold mining industry, poor working conditions, low wages, and

continued exposure to high levels of dust and inadequate health care of gold mineworkers. (Humby, 2014, p. 657; Churchyard et al., 2004; Steen et al., 1997, p. 24)

However, there is a limited ethical discussion on the morality of issuing a certificate of fitness to affected miners. Some scholars have argued that affected miners should not be given a certificate of fitness to work (where they are further exposed to silica dust) regardless of the degree of silicosis (Almberg *et* al., 2020, p. 3, 16). Suppose mineworkers are not issued a certificate of fitness, or an existing certificate of fitness is withdrawn. In that case, they cannot return to do risky work underground. This will limit the acceleration of silicosis and further lung impairment. From the utilitarian perspective, this limits the negative impacts on the affected miner and the society.

I am not aware of any study that has presented a counter objection to this position. However, it is not difficult to imagine that some may want to argue that if mineworkers are not allowed to work, even in risky environment, they cannot earn a living. The negative impact on them, their families and society will be huge. In a risk/benefit calculus, it might be preferable to issue a certificate of fitness to mineworkers to continue risk work underground. Perspectives from the global south are missing in this discourse. This is important since studies (Brown et al., 2016) continue to demonstrate that individuals are more likely to accept policies and guidelines that align with their values. To develop policies and guidelines for the gold mining industry in South Africa, this gap ought to be filled. My study will contribute to this by appealing to a combination of values/principles dominant in the Global South and welfarist theories to think critically about the morality of issuing a certificate of fitness to mineworkers who have early and mild silicosis. The idea that a

theory in the Global South can be combined with a theory dominant in the Global North has not been vigorously pursued. Hence, one other contribution of this study is that it demonstrates how approaches dominant in the Global South can be combined with approaches dominant in the Global North. This endeavor is intrinsically valuable and should be or relevance to academics

1.2.1 Research Question

This study focuses on the gold mining industry in South Africa and addresses whether it is morally justifiable to issue a certificate of fitness to gold mineworkers with early and mild silicosis to continue risk work underground. The specific research question I address is, “Is it justifiable to issue certificate of fitness to mineworkers suffering from early and mild silicosis to continue risk gold mining work underground?”

b. Thesis Statement

The study draws on the combination of welfarism and the under-explored afro-communitarian view of solidarity to argue that mineworkers with early and mild silicosis ought not to be certified to continue risk work underground in the gold mining environment where they are further exposed to silica dust.

c. Rationale of the study

This study is important for several reasons. It aims to create awareness of the social, economic and health impact of continued exposure to silica dust in the gold mining industry on affected mineworkers, their families and society.

Mining companies ought to take responsibility by providing adequate, reasonable accommodation on the surface, alternative jobs or contracts to sustain already affected workers financially. Previous studies have failed to demonstrate why and how

employers can assume this responsibility. This study contributes toward these goals. Equally, this study will conscientize policymakers to the importance of promulgating sustainable policies that prohibit the issuance of a certificate of fitness to already affected underground mineworkers, which can accelerates disease progression. Finally, this study clarifies the importance of compensating already affected mineworkers, and thus, contributes useful materials for reforming ODMWA, as well as force the conversation that needs to be had about compensation and reasonable accommodation for mineworkers suffering from mild and early silicosis. This will make a novel contribution in silicosis compensability principles in the mining industry. Having these conversations is intrinsically valuable, and will contribute to the well-being of mineworkers in the South African gold mining industry.

1.2.2 Research Design

This research project is a Type 1, a normative bioethical project that is in defense of my thesis statement.

1.2.3 Research Methods

This Type 1 project will be based on published resources gathered from desktop-based research. Sources used in defence of the thesis include journal articles, reports, government legislation and web-based articles; the primary engines used to access them are Google Scholar, Web of Science and PubMed. The relevant literature gathered will be discussed and analysed through an ethical lens, and I will be engaging in the interpretation and critical analysis of this literature to answer the research question. The analysis of the relevant literature will include the definition and clarification of concepts, the identification and criticisms of assumptions, the analysis

and evaluation of theoretical frameworks, and the articulation of the most reasonable interpretation of significant concepts found in literature sources

1.2.4 Aims and objectives of the study

AIM: The study defends the thesis statement that mineworkers with early and mild silicosis ought not to be certified to continue risk work underground in the gold mining environment where they are further exposed to silica dust.

Objectives:

1. 1.To defend the claim that the combination of key principles in welfarism and the under-explored Afro-communitarian view of solidarity can give rise to *useful* normative principles (for considering a variety of ethical issues including my research question), and the way they do.

2. To argue that the normative principles to which the combination gives rise (objective 1) imply that mineworkers, who already have early, and mild silicosis ought not to be certified to continue risk work underground. In this regard, one ought to place a greater moral weight on the good/well-being of mineworkers.

3. To defend the claim that the normative principles can inform policies and contribute useful materials for reforming existing Acts in ways that mandate varying types of compensation for all affected gold mineworkers.

4. To defend my thesis against potential objections.

1.2.5 Argumentative strategy:

Strategy 1:

- To realize *Objective 1* or defend the same,
    - First, I will address the question, "What key principles about welfarism emerge in ethical literature on the same?"
    - Second, I will address the question, "How do Afro-communitarians conceptualize solidarity?"
    - In the final analysis, I will combine the key principles of welfarism with the Afro-communitarian view of solidarity to descriptively derive useful normative principles. Specifically, in this final section, I will defend *how* and *why* the combination of the key principles of welfarism and the Afro-communitarian view of solidarity gives rise to the outlined normative principles.
    - Welfarists share the same fundamental theoretical conceptions as all utilitarians, and it is the view that morality is centrally concerned with the welfare of individuals. What advances an individual's welfare – their 'well-being' – are the things that increase their best interests, benefit them, or make them better off "in the most fundamental sense" (Keller, 2009, p. 82). I am appealing to the objective theory of welfarism as it aligns with my study in that it also embodies prudential values of well-being as its central theme. I will provide more details in the subsequent chapter

- Solidarity is a key value in African communitarianism. It enjoins compassion, empathy, respect for others, dignity, harmony, caring for one another in a way that promotes the flourishing and well-being of all community members (Munung, de Vries and Pratt, 2021). Afro-communal solidarity holds that morally right actions are those that promote the good of others. Specifically, I will appeal to the conception of solidarity as *social solidarity*. Social solidarity is premised on the following key elements: reciprocity, altruism, showcasing humanity, social protection and mitigation of adverse effects of poverty, unemployment and ill health in individuals and society. In subsequent chapters, I will demonstrate how African scholars understand social solidarity, the norms that can arise from this conception and the exact ways these norms can combine with key principles in welfarism.

<u>Strategy 2</u>:

- To realize *Objectives 2 and 3* or defend the same,
    - Through evaluative and reasoned arguments, I will argue that the normative principles (from strategy 1) can usefully justify my thesis; that is, mineworkers who have early and mild silicosis ought not to be issued fitness certificates.
    - Finally, to defend Objectives 2 and 3, I will show that the normative principles that emerge from strategy 1 can usefully inform policies and provide valuable information for reforming

existing compensation Acts and regulations governing mineworkers.

- This view has many positive implications, including promoting the health of mineworkers and society. I defend this position. My argument also demonstrates the importance of reducing exposure levels to protect the health, lives and livelihoods of miners and mineworkers. It also appeals to the importance of incorporating early and mild silicosis into the ODMWA compensation system.
- Equally, I acknowledge that there will be potential limitations of my argument. They include scarcity of alternative reasonable accommodation on the surface with high unemployment rates threatening the prospects of alternative employment in the real world. My argument could cause a backlash or met with resistance from mineworkers unions, and mineworkers that are currently not subsidized as mentioned above. There could also be economic disadvantages towards involved mineworkers and their families. The mining industry might suffer labor loss and decreased employment turn over with added training costs. In the second chapter, I will demonstrate how these potential issues may be anticipated and proactively addressed.

Strategy 3:

To realize *Objective* 4 or defend the same,

- I will defend my central claim against key potential criticisms that contend that:
    - I have *mischaracterized* the normative principles to which the combination of key principles in welfarism and the Afro-communitarian view of solidarity give rise.
    - These normative principles *do not* imply that workers who have early and mild silicosis ought not to be issued a certificate of fitness.
    - This central claim or position will leave mineworkers in a more precarious situation, and for this reason, it is neither morally realistic nor practicable.

- To counter these objections, I will defend how I have neither mischaracterized nor misapplied the normative principles to which the combination gives rise. Then show how mineworkers do not have to be in a more precarious situation if they are not issued fitness certificates. They can either be granted reasonable accommodation on the surface or early and mild silicosis ought to be included as compensable conditions. I will demonstrate how the normative principles I describe in the study entails the latter.
- I have not argued that the above potential criticisms are exhaustive of *all* likely criticisms against my position. However, through looking at the literature on silica dust exposure in the gold mining industry and my own reflection on the

subject, these are likely criticisms against my view. The outcome of the interrogation and discussion with my supervisor lends significant support that, at least, the above criticisms ought to be anticipated. Other potential criticisms would be developed in the course of my research.

1.2.6 Research Outcomes and Outputs

The study aims for at least a publication in an accredited journal, in addition to contributing towards the award of Master of Science degree in Bioethics and Health Law at the University Of Witwatersrand, South Africa. Additionally, I anticipate that this research will create greater awareness of the negative impacts of continued exposure to silica dust among key stakeholders in the South African gold mining industry.

Furthermore, the study will demonstrate the plausibility of home-groomed African approaches and theories for thinking about issues that affect Africans. For example, the African conception of solidarity can inform relevant ways of caring for vulnerable individuals or persons with limited resources in African communities.

Finally, the study will contribute valuable resources to inform policy changes that can accommodate the health and economic welfare of mineworkers, their families, and their communities in decision-making about risky work underground in South African gold mining industry.

1.2.7 Limitations:

This study has some limitations. This is a primarily conceptual study that relies on published resources. Some of these resources may not be available for free use. Equally noticeable is that empirical studies that explore ethical questions about risk

work underground are insufficient. Most authors focus on the clinical aspects and the disease burden of silicosis on the individual level. Some scholars who touched on ethical issues confined themselves to past injustices, compensation, inequalities and discrimination against black people and migrant workers. These are essential drawbacks since they limit the number of ethical studies this paper can draw on to critically consider the morality of risk work underground in the South African gold mining industry.

1.2.8 Ethical Approval

This study is a normative and mostly conceptual project. Particularly, the study does not involve research with human or animal subjects. For this reason, I will not be applying to the Ethics Committee of the University for ethical approval.

Chapter 2:

Conceptual Clarification: Welfarism and Solidarity in African Philosophy

2.1Introduction

In this chapter I define welfarism, describe the dominant forms of welfarism and highlight the welfarist theory that I will use in my study. Equally, this chapter will describe Afro-communitarianism and outline a key value (solidarity) in Afro-communitarianism that I will draw on. In the final analysis, I will combine solidarity with welfarism to derive moral norms for thinking critically about my research question.

2.2 Welfarism

Welfarism is a consequentialist theory, but differs remarkably from dominant consequentialist theories. For example, welfarism shares some features with consequentialist theories as both are focused on the outcome of an action. Examples of these consequentialist theories include: Utilitarianism which holds that right bases actions are those that promote pleasure to maximum number of individuals. Rule consequentialism on the other hand confines itself to evaluating actions by their motives and rules driving those motives. Social consequentialism hold acts as morally correct in so far as they bring about overall societal well-being. Ethical egoism is a form of consequentialism that promotes self-interest, actions are morally acceptable in so far as they promote the agent's well-being.

Welfarism is a moral and political theory that combines a theory of welfare and a concern with welfare as the good. Precisely, it holds the view that only the well-being or welfare of individuals determines the value of an outcome or state of affairs.

A desired state of affairs can take a subjective form, where well-being is evaluated by personal experiences of happiness, joy, freedom, respect, knowledge, health and achievement, and living in harmony with others. This form of welfarism is also known as or satisfaction theory. It has also been described by Simon Keller as the mental state theory where the state of well-being is determined by an individual's subjective feeling of good personal experiences. It can also be objectively evaluated by being intrinsic and lacking pro-attitude . This theory is likened to Hedonism where pleasure or enjoyment are the only things that ultimately constitute well-being. (Moore and Crisp, 1996)

Another dominant form of welfarism are desire theories, whereby well-being is a matter of getting what one wants, prefers, desires, or chooses. (Moore and Crisp, 1996,p. 600) This theory has been described by Simon Keller as the ability of an individual to get what they actually want or what they would desire to get under certain hypothetical circumstances, where their desires are satisfied and their wants are fulfilled. This is another subtype of subjectivistic evaluation where well-being is measured by achieving personal desires.

Finally, there are objective or ideal theories of welfarism. This form of welfarism concedes of well-being as an ideal. Central to this theory is the identification of prudential values that constitute well-being. These are essential and intrinsically make our lives better and do not depend on our attitude towards them, or on whether we

enjoy or want them. These include health, knowledge, love, freedom, economic well-being and respect. They are ideal values that are needed to promote individual good and well-being.

As Andrew Moore and Roger Crisp point out, morality is fundamentally a matter of the well-being of individuals (Moore and Crisp, 1996)). Equally, consider the following remark by Simon Keller that welfarism is the "view that morality is centrally concerned with the welfare or well-being of individuals" (Keller, 2009, p.82) . In the same vein, Ben Bramble contends that welfarism is an unconditional theory of value or good that is a simpliciter. Bramble further classifies the theory as either pure or impure welfarism, where pure welfarism is concerned with levels or degrees of well-being and impure form is concerned with elements of well-being, and its distribution throughout the population (Bramble, 2013,p.1,p.2) (Bramble, P1, P2). Summarily, in welfarism, nothing but welfare matters, basically or ultimately, for ethics. In other words, ethics has ultimately to do with ensuring that lives go well, or at least that they do not go badly, and that all creatures and sentients deserve to share this moral standing (Bramble, 2013

Different welfarists propose different material conditions for thinking about well-being or welfare. Three theories of welfare or well-being are prominent as explained above: satisfaction theories, desire theories and objective or ideal theories. Satisfaction theories suggest that well-being is measured by an individual enjoying, liking, or taking pleasure in what they derive in life. This theory has been described by Keller as the mental state theory where the state of well-being or welfare is determined by an individual's subjective feeling of good experiences. Second, desire theories

understand well-being as a matter of getting what you want, prefer, desire, or choose Moore and Crisp, 1996) This form of welfarism tends to think of welfare as desire-satisfaction, whereby an individual gets what they actually want or what they would desire to get under certain hypothetical circumstances, where their desires are satisfied and their wants are fulfilled. (Keller, 2009, p.84).). Finally, objective or ideal theories, some of the prudential values in this theory are essential and intrinsically make our lives better and not necessarily depend on our attitude towards them or on whether we enjoy or want them. These include health, knowledge, love, freedom, economic well-being and respect.

The Objective Theory of Welfarism.

This study will draw on the objective theory of welfarism. Objective welfarism theory is measured by the ability to protect, promote and maximise these prudential values in an individual or a group of individual. Values in this theory are essential and intrinsically make lives better and do not depend on our attitude towards them or on whether we enjoy or want them. These include health, knowledge, love, freedom, economic well-being and respect. These items are regarded as basic and fundamental, they are inherently valuable in, not because of some instrumental value they provide, but because of the intrinsic good they bring about.

It is said to be is independent, at least in part, from the criteria of satisfaction and fulfilment. On the other hand, objective list theories do no imply that people would benefit from being forced, obligated or coerced to pursue objective goods against their will. Autonomy and happiness are also taken into consideration in this regard, thus striking a balance and adopting a more hybrid option might be a

better right based action towards pursuing individual well-being. The theory is more inclined towards advancing positive attributes that yield perfection of human nature, meeting of needs not wants**,** of valuable activities and improving better states of affairs. (Moore and Crisp, 1996).

Some prudential values pertinent to my study include health, wealth (or economic well-being), pleasure and friendship or good interpersonal relationship. In so far as mineworkers are concerned, protection of their health is a major concern, but of equal importance to them is their financial stability; an ability to maintain themselves and their families financially. This will therefore imply that decisions taken by the industry concerning mineworkers who have early and mild silicosis need to take their individual health and financial well-being into consideration. Health is central to financial well-being since sickness can prevent individuals from working and thus, earn an income

2.3 Afro-communitarianism

Afro-communitarianism or Ubuntu is an alternative moral theory to dominant theories in the West, and has been described by Nchangwi S. Munung and colleagues as a philosophical approach or moral theory by which many populations or ethnic groups in sub-Saharan Africa reflect and act towards each other, in humanness, communitarian, justice and fairness. (Munung, et al., 2021, p. 378). The authors have further captured the principle of Ubuntu into seven fundamental values of solidarity, reciprocity, open sharing, inclusivity, deliberation, consensus, trust and accountability (Munung, et al., 2021, p. 378).

As a normative theory, Afro-communitarianism generally considers acts as wrong when they do not constitute a regard for others, or if they violate friendship with others (Ewuoso and Hall, 2019 p.100). In other words, right actions are those that promote communal relationships as in, harmonious existence with others, caring, sharing and promoting wellness in others and pursuing common good for the benefit of all. Afro-communitarianism is further construed by Cornelius Ewuoso and Susan Hall as a fundamentally relational ethics that involves emotions of empathy and concerns about others in deciding. The preceding ought to matter in deciding which actions are appropriate. (Ewuoso and Hall, 2019)

Communal relationships, as argued by Thaddeus Metz are those in which people identify with one another, share a way of life, and demonstrate solidarity towards one another and are concerned about other's wellbeing (Metz, 2011, p20). He further claims that typical human beings have a dignity by virtue of their capacity for relationships and that human rights violations imply degradations of this capacity. In his view, harmony is achieved through close and sympathetic social relations within the group. This theory tends to be anti-egoistic as it discourages self-seeking behaviour without regard for, or to the detriment of others (Metz, 2011).

The philosophy of Ubuntu is further expressed by Chika Onyejiuwa as the one that comes with the capacity to realize that each and everyone's life is intricately tied to the other, and that pursuit of the common good far supersedes creating isolated individual good (Onyejiuwa, 2017)

2.3.1 Solidarity

Solidarity as described by Nchangwi S. Munung and co-authors is a key value in African communitarianism that is broadly construed as the realisation that one's capability depends on others and that common good should be pursued rather than the individual good. (Munung, et al., 2021, p. 37). The principle of solidarity enjoins compassion, empathy, respect for others, dignity, harmony, caring for one another in a way that promotes the flourishing and well-being of all community members (Munung, de Vries and Pratt, 2021). Afro-communitarian view of solidarity thus implies that that morally right actions are those that promote the good of others. Particularly, it holds the view that pursuing the common good is far better than pursuing individual good. Thaddeus Metz's formulation of solidarity entails engaging in mutual aid, where actions are reasonably directed at outcomes with benefits to others for their sake (Metz, 2011, P538). Thaddeus Metz further argues that solidarity is tied to people's attitudes, which implies that they are basically driven by emotions and motives to act positively towards others for their own sake.

Nancy Jecker and Caesar Atuire echo the preceding motivational factor. They conceptualise the African solidarity as a framework that includes both aspirational and normative elements (Jecker and Atuire, 2021, P30)). The aspirational element implies the component that compels individuals to uphold ideal human values of kindness, compassion, respect and concern for others well-being and the normative aspect as prescriptive, morally requiring individuals to conduct themselves in ways that promote the good of others and the community, for the benefit of all (Jecker and Atuire, 2021, P30)..

African thinking about solidarity informs some common practices on the African continent such as assisting others without cost calculations or expecting anything in return (Fayemi, 2021, P52).). Other practices that are informed by the African philosophy include shared responsibility to ensure that no one falls beneath the minimum threshold of what would be considered human personhood (Jecker and Atuire, 2021, p31)

According to Mashele Rapatsa, solidarity is the one of the principles that informs the law on how to respond to societal social goals and expectations and sets standards in addressing them. The author contends that this principle ought to be recognized as a theory that is inherent in the essence of human beings (Rapatsa, 2014, p. 966). In this project, I will appeal to the conception of solidarity as *social solidarity*. I describe this below.

2.3.2 Social Solidarity

Solidarity is an element of humanity that demonstrates social cohesive bonds holding groups of people together. A common good that holds groups of people together. There are however different motives for solidarity, ranging from affection, compassion, empathy shared norms and beliefs, while others are driven by rational choices and self-interest (Douwes, Stuttaford and London, 2018). The authors contend that the NHI (National Health Insurance) in South Africa should be considered an experiment in social solidarity as it explores the interplay of trust, reciprocity, and altruism and their advancement towards solidarity and collective action.

Social solidarity as construed by Mashele Rapatsa is essentially a concept premised on helping the underprivileged people to sustain a dignified life (Rapatsa, 2014, p. 971). Mashele Rapatsa describes solidarity as a significant and fundamental element of social security embodied in the constitution of South Africa. (Rapatsa, 2014). The key elements of social solidarity identified by Mashele Rapatsa include reciprocity, altruism, showcasing humanity, social protection and mitigation of adverse effects of poverty, unemployment and ill health in individuals and society (Rapatsa, 2014, p. 966). I will discuss each of these elements below.

2.3.3 Reciprocity

Reciprocity implies assisting others with the assumption and expectation of the favour being returned back in future. It is a strong driver of behaviour and contributes to equality in relationships. The concept comes with an obligation to return the favour in the future, which enhances fluidity and continuity in associations. Reciprocity promotes solidarity and shared interests by encouraging and fostering repeated interactions among members in the solidary group. It has been used to explain the motive behind continued collective action in situations where instant incentives is not apparent (Douwes, Stuttaford and London, 2018).

2.3.4 Altruism

Altruism refers to behaviour that reflects a selfless desire to help others. It is the opposite of selfishness and involves placing what is good for others above what is good for oneself. It comprises a moral obligation to self-sacrifice in the name of common good.

Pure altruism contains no expectation of receiving any favour in return. It is performed voluntarily and intentionally with no expectation of favours. Renate Douwes and colleagues argue that altruism should lie at the basis of social solidarity to avoid selfish behaviour and that individuals should consider not only their own interests, but also their duties to the community (Douwes, Stuttaford and London, 2018)

2.3.5 Humanity and trust

The Afro-communitarian philosophy of Ubuntu is sometimes literarily translated as humanness, implying that it requires individuals to showcase humanity to one another. The preceding often requires trust. Without trust, the moral requirement of Ubuntu will be stifled and threatened. It may be infiltrated by untoward motives that would make it an unpleasant practice to embark on. I have discussed Ubuntu in the subsection of Afro-communitarianism. I will confine myself to discuss trust in this section.

Trust, as described by Renate Douwes and colleagues, is a relational concept that can be instituted between two individuals or between an individual and an organization. It is a voluntary action based on expectations of how others will behave in the future in relation to yourself. This concept has been widely recognized as enhancing cooperation between individuals and groups and ensuring that economies and nations thrive (Douwes, Stuttaford and London, 2018).

2.3.6 Social Protection

The principle of social protection mostly finds its expression where dealing with vulnerable indigent members of society is concerned. Mashele Rapatsa had in 2014 explored the significance of social solidarity within the context of social protection. Social protection is aimed at mitigating the adverse effects of poverty, unemployment, socioeconomic factors and ill health for individuals and society (Rapatsa, 2014). The concept of Social protection has also been argued by Goudge and colleagues, where they highlighted the impact of ill-health in perpetuating poverty in communities and argued that social protection is the mitigating factor in preventing the damaging downward spiral of poverty and illnesses in communities and society (Goudge, et al., 2012, p. P.155).

Section 27(1) (c) of the constitution of the Republic of South Africa makes provision for social security and social protection. This obligates the state and private role players to be concerned for the social solidarity principle when dealing with issues of vulnerable and indigent people in society. The state attempts to demonstrate social solidarity through the provision of state funded houses, free education, free health system, free education and social grants for indigent people (Rapatsa, 2014).

2.3.7 Combination of Welfarism and Solidarity

In this section I will discuss shared values between objective Welfarism and African Solidarity theories as well as the contrasting views between them.

Particularly, both theories are premised on achieving well-being and the common good for an individual and others. Right actions in both are those that promote,

maximise or protect well-being and good state of affairs. In other words, both theories address protection, promotion and maximising well-being of individuals and societies. This well-being encompasses the health, economic, social and global areas of functioning of individuals, their families and communities. Both theories have an element of consequentialism where actions are evaluated as being morally current in so far as they yield well-being and good for individuals and others in society or communities. The common core values in both principles is the driving force that persuaded me to combine the two to formulate the normative principle that I used in the report. While acknowledging the lack of existing suitable normative principle to argue my claim, using a well established Western theory of Welfarism in combination with an underused, yet strong Afro communitarian principle makes the combination and argument stronger as it brings both Africanism and Westernised approaches together towards resolving ethical issues in Africa and around the world.

These approaches equally differ. Welfarism is an established theory, well defined and used globally. African Solidarity is underutilised with an aspiration and a call for it to be a theory that can contribute an African ethical perspective in evaluating moral issues in Africa and globally. African Solidarity is African brewed while Welfarism is a Western moral theory which is more individualistic and where autonomy is given greater emphasis than is found in the African thinking about solidarity. Additionally, the view of solidarity grounded in Afro-communitarianism tends to enjoin individuals to foster communal good more than self-interests, though respect for individuals is recognised, individual autonomy is superseded by societal needs where contrasting views are concerned.

Given the emphasis that both Welfarism and solidarity place on protection, promotion and maximizing well-being, one normative principle that arises here is that we ought to act in ways that limit harm to individuals, and improve their overall health and social status.

In the next section, I will demonstrate how this principle implies that mineworkers with early and mild silicosis ought not to be issued with a certificate of fitness to continue risk work underground where they are further exposed to silica dust. Invariably, issuing certificate of fitness to mineworkers with early and mild silicosis will be immoral based on the principle I apply in this study. I will demonstrate how this principle protects mineworkers from an accelerated progression of silicosis, and/or prevent harm to society and relatives. Equally, I will address potential objections that point to the economic implications of the position that I endorse. I will equally justify alternatives that may be considered in place of issuing certificate of fitness to the class of mineworkers that I consider.

2.4 Concluding statement

In this chapter, I have discussed welfarism and combined it with social solidarity to develop a normative principle. A critic may point out here that on the one hand, the account of both welfarism and Afro-communitarianism is simplistic, and on the other hand, the principle that emerge from the proposed combination of these ethical theories is not sufficiently developed. In response, although the goal of this present chapter is mostly descriptive, that is, the chapter aims to describe a principle of right action that may be grounded in the combination of welfarism and social solidarity,

nonetheless, the goal of the overall project is mostly evaluative, that is, to demonstrate the implications of the norms that can arise from the combination of Afro-communitarianism and welfarism. The descriptions of Afro-communitarianism and welfarism have already been undertaken by several other scholars (Keller, 2009, Metz 2011) . This project builds on their accounts. In light of the preceding, the question is not whether the moral norm that arises from the combination is sufficiently developed. The main question is whether this moral norm can arise from the description of Afro-communitarianism and welfarism, and it can. In the next chapter, I will apply this theory to think critically about the morality of issuing certificate of fitness to mineworkers who have early and mild silicosis.

Chapter 3.

Silicosis and the Gold Mining Industry

3.1 Introduction

In this section, I will provide a clinical picture of silicosis, its prognosis and the health burden it poses in South African Gold mining industry. I will further discuss the roles different bodies and the stakeholders responsible for limiting silica dust exposure, silicosis and its complications and impact on the mining industry. I will explore ethical issues associated with silica dust exposure, the disease and the challenges encountered in addressing them. In the final section, I will draw on the norm I described in the previous chapter to outline how the challenges silicosis raises for the South African gold mining industry may be addressed.

3.2 Silicosis: Nature, Types and Degrees

The information I provide here has been partly stated in the introductory section. Nonetheless, it is important to restate some key information about silicosis to help the reader understand why the norm I apply in this section implies that mineworkers who have early and mild silicosis ought not to be issued certificates of fitness to continue risk work underground.

Silicosis has been described by Vani Mamillapalli and colleagues as the commonest occupational lung disease in the world. The disease is also known as miner's phthisis and is a form of pneumoconiosis that is caused by inhalation of respirable crystalline silica dust (Mamillapalli et al., 2019). The disease is found in many industries and most commonly in the gold mining industry. As previously stated, silicosis is an

irreversible, and potentially fatal fibrotic disease that develops following the inhalation of large amounts of silica dust more than 0,05m3/mg over time (Greenberg et al., 2007)). This should be of concern to everyone. Chi Chiu Leung and colleagues equally maintain that this incurable fibrotic lung disease is progressive, and causes lung function deterioration and complications over time. The lung function deterioration increases with disease progression even after the affected individual is no longer exposed to silica dust (Leung et al., 2012)

The different forms of silicosis are worth differentiating. Some of them have been identified by Vani Mamillapalli and colleagues in 2019, and confirmed by David Stanton and colleagues (David Stanton et al., 2006; Mamillapalli et al., 2019). They include simple chronic, accelerated, acute, and complicated silicosis.

Simple chronic silicosis is a common form of silicosis and occurs after about 10 years of consistent exposure to crystalline silica dust. It is usually asymptomatic, meaning that the affected individual may display no symptoms or minor symptoms like cough, dyspnoea, fatigue and sweating, especially where nodules coalesce to form PMF (Progressive Massive Fibrosis). PMF may be associated with the deterioration of lung function capacity. Accelerated silicosis may appear sooner than the latency period of 10 years, where exposure levels of silica dust are higher than 0,1m3 / mg (Greenberg Michael et al., 2019). It usually occurs within 5-10 years of first exposure to high levels of crystalline silica dust. The clinical presentation and radiological pictures are similar to chronic simple silicosis with more rapid progression to PMF and lung function impairment. Acute silicosis occurs when one is exposed to even much higher levels of 3m3/ mg or more of silica dust within a short space of time. (Greenberg et

al., 2019). It can take between weeks and up to 5 years for exposure to become acute and is associated with severe symptoms of breathlessness, cough, weakness and death. This form is also known as Silicoproteinosis.

Finally, complicated silicosis is associated with gradual severe lung scarring and PMF. Complicated form of silicosis is more common in accelerated silicosis than in simple chronic form. It is more associated with complications like Cancer, TB infections and severe lung impairment, co-pulmonale and death.

According to the international labour organization, silicosis is further graded into 4 degrees according to its severity. These grades are based on radiological findings as per ILO (International Labour Organization) and are directly proportional to the degree of disease progression and not to forms of silicosis. For instance, early and mild silicosis are not regarded as full-blown silicosis and, therefore, not related to forms of silicosis.

Early silicosis implies the beginning of silicosis and is read on an X-Ray as 0/1. The nodules are visible, but the profusion or their distribution consists of sparse distribution of a few number of nodules in the upper lobe of either the left or the right lung, but not both and no lung impairment.. ILO 1/1, p, q or r depending on the size of silicotic nodules, describes mild silicosis where both lungs are affected in the upper lobes only, with no associated lung destruction, no complications and no clinical manifestation of the disease, with a normal FEV 1 of more than 65 %. Mild silicosis is said to be recognized by ODMWA act as an Occupational disease of less than 10%.

The ILO classification in moderate silicosis is read from 2/2, 2/3 or 3/3 with any size nodules according. ILO 2/2 imply the involvement of the upper and middle lung

lobes bilaterally, whereas 3,3 imply a larger profusion with many nodules involving all the lung fields, but with minimal lung deterioration, (FEV 1 between 65% and 52 %). Moderate or First-degree silicosis is also known as occupational lung degree with 10-40 % impairment, and is a first degree silicosis. FEV1 implies forced expiratory volume measured by a spirometer, a measuring tool for lung function capacity.
The profusion in second-degree or severe silicosis and its radiological readings are like those described in first-degree silicosis. However, in second-degree silicosis, there is the presence of marked lung function deterioration with an FEV1 measuring less than 52%. This could be due to the coalescence of nodules, as in PMF described above or lung fibrosis in the absence of PMF. Second-degree is said to have more than 40% impairment. Second-degree is also diagnosed in the presence of silicosis in addition to any of its associated complications like tuberculosis, lung cancer, chronic obstructive lung disease, cor-pulmonale or where silicosis leads to the actual death, as in accelerated silicosis. This is irrespective of the lung function test finding. (International Labour Office., 2002; *ODIMWA 78 of 1973,* Chapter IV)

3.2.1 Diagnosing silicosis

Silicosis is not always easy to diagnosis especially if it is simple chronic silicosis. There are no specific pathognomonic signs and symptoms associated with the disease. Symptoms are non-specific across the different forms of this disease. Nonetheless, some symptoms include cough, chest pains, dyspnoea, sweating and fatigue. But these symptoms also tend to be associated with other conditions. Specifically, there are a number of diseases like pulmonary TB, sarcoidosis, autoimmune diseases and

idiopathic pulmonary fibrosis that may pose as differential diagnoses of silicosis (Greenberg et al., 2007).

One way to diagnose this disease is a chest X-ray using the ILO classification, where round discrete opacities are seen in the upper zones of the lungs (Mamillapalli et al., 2019). ILO (International Labour Organization) classifies silicosis into the following: 0/0; no silicosis; 0/1, early silicosis; 1/1, mild silicosis; and anything from 2-3 being moderate and severe. The radiological readings of mild and early silicosis show fewer silicotic nodules with no lung destruction or impairment than those found in first and second-degree silicosis. The risk of pulmonary TB remains equally high in silicotics, even in the absence of radiological silicosis. CT scans, lung biopsies and autopsy reports (in cases of deceased affected people) are other means of diagnosing silicosis (Greenberg et al., 2007).

Lung function tests are performed to verify the degree of impairment as discussed above. The forced expiratory volume is taken into consideration in this regard. FEV1 of less than 65% to 52 % in the presence of silicotic nodules P2/2 or more being taken as first-degree. Second degree being recognized in the presence of severely deranged lung function tests of less than 52 %, which imply severely compromised lung function capacity (ODMWA 78 of 1973).

3.2.2 Prognosis

Prognosis is problematic given that no known cure for silicosis exists (Greenberg et al. 2007). Diagnosed progression to severe stages of the disease is inevitable, even after exposure to silica dust has stopped. Continued exposure to silica dust leads to accelerated progression of the disease, its complications and early demise. Delaying

disease progression coupled with supportive symptomatic treatment is the cornerstone of managing the disease in affected individuals.

3.3 Silicosis in South African Gold Mining industry

Silicosis generates an ethical dilemma for the mining industry. Miners are the most vulnerable to developing different forms of silicosis, yet the livelihood of miners often depends on this job. Suppose miners have compromised immunity and can no longer work underground. In that case, the economy will also be negatively affected.

Both the industry and the government have made laudable efforts to limit exposure and/or risk of silicosis exposure to miners. As previously stated in the introduction, some of them include the promulgation of legislations and Acts to address occupational health in the South African mining industry. The Mine Health and Safety Act (MHSA) and the Occupational Health and Safety Act (OHSA), and the Occupational Diseases of Mine and Works Act (ODMWA) are concerned with ensuring that the gold mine employers provide a conducive and safe working environment for their employees. Measures employed to mitigate silica dust exposure include health risk assessment (HRA) and employment of control measures to mitigate exposure levels. Effective control measures require the employment of engineering controls like ventilation and dust collection systems, the use of water sprays and wet drilling to control the dust. Workers' education and training on self-protection, protection of others, the importance of the use of PPE and complying with control measures put in place. Continuous monitoring and sampling of air to determine dust exposure levels, periodic medical surveillance to determine those with early signs of respiratory diseases and to determine fitness to continue working and

conducting audits on the prevention programmes above and continuously improving on them (David Stanton et al., 2006).

Notwithstanding the best effort to limit silicosis, studies continue to demonstrate that miners are at a high risk of exposure to silica dust. Gavin Churchyard and colleagues have reported and an average risk rate of 18-20 % of silicosis in South African gold mineworkers. An increased rate was later stated to be 24 % in a report compiled by Girder-Brown and colleagues in 2008 (Girdler-Brown et al., 2008, p. 645; Churchyard et al., 2004). Different stakeholders have made significant efforts to ensure that exposure to silica dust is reasonably managed. The tripartite alliance, which consists of the government, the mineworkers' unions and the gold mining industry employers, had in 2003 articulated clear and precise steps for reducing silica dust occupational exposure levels and to move towards total eradication of silicosis by 2030. Milestones were developed to bring the current Occupational exposure levels of 0,1m3/mg to less than 95% by December 2008 and the eradication of new cases entering the industry after 2008 (Hermanus, 2007, p. 535).

Additionally, the Department of Labour has been actively involved through its development of the National Programmes for Elimination of Silicosis that outlines the commitment of the government to reduce silica dust exposure and elimination of silicosis as per ILO, WHO (World Health Organisation) and the global programme for elimination of silicosis requirements which include mitigation of silica dust exposure levels in the mining industry through control measures mentioned above, monitoring of compliance of legislature by different mining groups, continuous inspection,

sampling and monitoring of dust to evaluate OEL, conducting of audits to monitor compliance and improve on processes (David Stanton et al., 2006).

Equally at the forefront in the fight to eliminate silicosis is the Chamber of mines of South Africa, which has consistently developed research in continuous sampling and analysis of dust in the industry to measure exposure levels, collecting data of miners diagnosed with silicosis and reporting on silicosis novice cases that entered the mine after 2008. The Chamber is also involved with programmes of continuous educational workshops with key stakeholders in the industry (The unions, The OMPs, The Health and Safety officers, employers and Government) to prevent silicosis in the gold mining industry (David Stanton et al., 2006). These include continuous sampling and measurements of silica dust. Occupational exposure levels in South African gold mines to monitor compliance, recording of novice cases of silicosis from various mines (these are new cases of silicosis in miners that entered the industry after 2008). Continuous workshops with stakeholders to discuss loopholes and how to improve control measures to improve exposure to dust.

Equally worth mentioning here is that the South African government has equally determined silicosis as a compensable condition through ODMWA, but with certain conditions. Under ODMWA, first and second degrees of silicosis are compensable. Early and mild silicosis are non-compensable, implying that individuals diagnosed with early and mild silicosis must continue risk work underground, where they are further exposed to silica dust. First-degree is partially compensable and those affected have the potential to be afforded non-risk work on the surface. Compensable condition refers to an occupational disease that has the potential to be compensated, as per

ODMWA (ODMWA 78 of 1973). Alternative employment on the surface, which is scarce, is reserved for those with first-degree silicosis, and only a few of them can be accommodated. Miners with second-degree silicosis are fully compensated, meaning they are paid the highest once off –lump of up to R159 000, 00 payable by CCOD (the Compensation Commissioner for Occupational Diseases) as per ODMWA, and completely prohibited to continue working in the industry. This form of selective and inadequate compensation system has led to challenges in managing miners already affected by early and mild silicosis.

Occupational health practitioners ought to be at the fore front of protecting, promoting and maximising health and well-being of miners in the industry. However, these professionals are at times caught between loyalty to mine owners, who pay their salaries and the professional duties to save lives and promote health of mineworkers (Dipalesa Mokoboto, 2020). This situation is further complicated by poverty, which sometimes forces gold mineworkers to prefer work to their health even after developing early/mild silicosis

Some studies have demonstrated the tendency by the industry to practice unjust exploitation and compensation of migrant black miners engaged in risk work underground. This would imply that the health and well-being of such miners diagnosed with mild and early silicosis are often of no concern to the employer at all (Humby, 2016). Ethical issues of racial inequalities of the past dispensation, unfair labour practices, poor working conditions, low wages and continued exposure to high levels of dust coupled with inadequate healthcare systems and lack of continuity of

care were also explored in other studies (Humby 2016, Girdler-Brown et al., 2008, p. 645, Churchyard et al., 2004).

3.4 The impact of silicosis

The impact of silicosis is not only limited to the affected individuals. The negative impacts equally extend to the mining industry and may potentially lead to public health disasters (Stewart, 2020, p. 1157). For example, in Lesotho, Brendan V. Gilder-Brown and colleagues found that miners repatriated to the country from South Africa significantly increased the country's disease burden (Girdler-Brown et al., 2008, p. 644) Healthcare facilities are often not easily accessible in villages where the miners return to, under-resourced and overburdened. The implication of this is that families and communities will be burdened with caring for sick mineworkers with limited or no resources. The impact is not only limited to families of mineworkers, but extends to society. Particularly, sickness has economic implications since immobility and caring for sick people almost always translate to lost wages and income. Income is important for procuring healthcare. The result is that many affected miners will not receive the care they require and may die from silicosis (Steen et al., 1997, p. 24). This situation calls for ethical reflection and comprehensive management strategies to improve quality of life and/or delay/slow down disease progression. Additionally, urgent efforts are required to control silica dust occupational exposure levels in the mining industry.

In the next section, I demonstrate the implication of the norm which I derived in the previous section for continuing risk work underground after exposure to silica dust. It is worth stating that the combination of Welfarism and solidarity implies that we

ought to act in ways that limit harm to individuals, and improve their overall health and social status.

3.5 Welfarism, Social Solidarity and Risk Work

Occupational Medical Practitioners (OMPs) have a crucial role to play in protecting mineworkers already diagnosed with mild and early silicosis from further exposure to silica dust. OMPs are responsible for performing medical surveillance and issuing certificates of fitness to miners to continue risk work underground as per ODMWA 78 of 1973 Chapter 111. Medical surveillance implies periodic medical examinations, X-rays and lung function tests to determine fitness for duty. These are conducted yearly to gold miners to determine the emergence of silicosis. Issuing certificates of fitness to those with mild and early silicosis implies that they are sent back underground, where they are further exposed to the silica dust hazard. Suppose, as I have demonstrated, that silicosis is irreversible, incurable, and a progressive disease which ultimately leads to death. In that case, issuing certificates of fitness to individuals who have early and mild silicosis undermines the well-being of these individuals, their families and society. In many ways, this is a failure to act to limit harm since and protect the health and well-being of mine workers. When individuals who have early and mild silicosis continue risk work underground, they are further exposed to silica dust, and the condition is accelerated. The reader should notice that the norm I apply here implies that OMPs in the gold mining industry ought to act in ways that limit harm to individuals, and improve their overall health and social well-being. In this regard, a greater degree of moral weight ought to be placed on the health and well-being of miners.

Additionally, it is also a failure to be concerned for the independence and the financial well-being of their families. Health is central to financial well-being since sickness can prevent individuals from working and thus, earn an income. To protect, promote and maximise the health and global well-being of miners with early and mild silicosis, therefore, imply that they ought not to be issued a certificate of fitness that allows them to continue risk work underground. This will prevent further exposure to silica dust that could lead to accelerated progression of silicosis with subsequent respiratory impairment, increased risk of pulmonary tuberculosis, lung cancer, and other complications of silicosis and early demise of mineworkers.

There are other ways of issuing certificate of fitness to mineworkers who have early and mild silicosis that do not violate the norm to which the combination of Welfarism and Solidarity gives rise. Suppose both Welfarism and Solidarity emphasize protection, promotion and maximising well-being of others. In that case, to demonstrate health, social and economic protection, promotion and maximisation of well-being of miners, their families and communities, OMPs need to prevent exposure (and accelerated disease progression) to miners.

I acknowledge that the position I advance here has economic implications and may be resisted by the miners, mining industry and other stakeholders. I will explore some potential objections in the next section. Particularly, I will argue that this principle does not imply that this group of mineworkers will be left in a more precarious position. There are other alternatives that can be employed on a balance of probabilities. These include alternative accommodation on the surface, inclusion of mild and early silicosis into the ODMWA compensation system and promulgation of

more sustainable compensation policies as well as acceleration of effective control measures to lower occupational exposure levels in order to protect underground mineworkers from contracting silicosis.

3.6 Concluding Statement

In this chapter, I have demonstrated how the norm to which the combination of Welfarism and Solidarity gives rise and implies that OMPs ought to be primarily concerned with the well-being of miners, implying that mineworkers who have early and mild silicosis ought not to be issued certificate of fitness to continue risk work underground where progression of their condition is accelerated. Additionally, I have also demonstrated how this norm implies that mineworkers with early and mild silicosis ought to be included into ODMWA compensation system. I will now turn to the next chapter to explore some objections to this position.

Chapter 4:

Addressing Potential Objections

4.1 Introduction

This chapter will focus on describing possible objections or potential criticisms that might be raised against my central claim. The chapter discusses these objections and responds to them. Specifically, the chapter responds to a potential criticism that I have mischaracterised the normative principle to which the combination of welfarism and solidarity gives rise. Equally, it addresses the criticism that the normative principle, suppose I am correct that this principle arises from this combination, does not imply that mineworkers with early and mild silicosis ought not be issued certificate of fitness. Also the chapter responds to a potential claim that refusal to issue certificate of fitness to mineworkers with early and mild silicosis would leave them in an even more precarious situation than they already are. Finally, the chapter explores whether the thesis of this project amounts to a violation of mineworkers autonomous rights to informed decision-making.

Before addressing these objections, the reader can benefit from a brief summary of the previous chapters. This project has defined welfarism, described the dominant forms of welfarism and highlight the welfarist theory of objectivity that I use in this study. I also describe Afro-communitarianism and outline a key value of solidarity that I draw on. In the final analysis, I combine solidarity with welfarism to derive a normative principle for thinking critically about my research question. Specifically, I contend that this combination implies that we ought to act in ways that limit harm to individuals, and improve their overall health and social status.

In the subsequent chapter, this project paints a clinical picture of Silicosis, its prognosis and the health burden it poses in the South African Gold mining industry. I further discuss the roles that different bodies and stakeholders play in limiting silica dust exposure, silicosis and its complications and impact on the mining industry. Finally, I demonstrated how the normative principle I described in the previous chapter implies that mineworkers who have early and mild silicosis ought not to be issued certificate of fitness to continue risk work underground.

4.2 Potential Objections

4.2.1 Mischaracterization of the normative principles

There are different ways critics may challenge the thesis this project defends. One line of objection is that I have *mischaracterized* the normative principle to which the combination of key principles in welfarism and the Afro-communitarian view of solidarity give rise. Evidently, welfarism is itself a belief in a welfarist state. Particularly, it is premised on the notion that a state has, as one of its primary duties, an obligation to take care of its citizens, their well-being and overall good. In order for the welfare state to promote the well-being of her citizens, it ought to provide the necessary conditions that make commodious living possible. Everyone should receive basic, social and material security, as well as have access to education and information. These conditions are financed through taxes. The point here is that welfarism tends to be directed to the good of all. As a consequentialist theory, promoting the good of all citizens might entail violating or breaching the rights of

some individuals. Such violations are justified – from this perspective – should they foster the overall good.

Equally, solidarity in African philosophy appears not to imply that we ought to do what fosters the good of the individuals, but of communities. In fact, in many formulations of Afro-communitarianism, a common tendency is to describe the philosophy as essentially requiring individuals to foster the good of the community. This idea is aptly articulated by Josiah Cobbah who remarks that “the starting point is not the individual but the whole group" in Afro-communitarianism. The community is often described as having moral priority over the individual. The community is equally the standard by which we ought to access the individual actions. (Cobbah. 1987, p 322)

What the preceding description implies is that suppose welfarism, including social welfarism, could be combined with the African view of solidarity to derive a moral principle. In that case, the principle would imply that we ought to do what fosters the good of all, the good of society even when this is sometimes realized through the violation of individual rights. This has implications for how we think about the question concerning whether certificate of fitness ought to be issued to mineworkers already affected with early and mild silicosis. Specifically, it would mean that issuing certificate of fitness to mineworkers, including mineworkers with early and mild silicosis, is justified to the extent that this is necessary to promote the economic and well-being of the society. Suppose that a refusal to issue certificate of fitness to mineworkers would plunge the society into debts and misery. Additionally, suppose non-issuance of certificate of fitness to mineworkers with early and mild silicosis will

undermine economic, social and global areas of functioning of the society. In that case, the normative principle that the combination of these approaches give rise to therefore would imply that the certificate of fitness ought to be issued, including to the mineworkers who have early and mild silicosis.

In response to the above critic, I argue that economic well-being is one aspect of the overall well-being of individuals and society. We need to judge well-being objectively and on a broader spectrum. The long-term effects of our actions and their consequences need to be prioritized over instant gratification and short-term solutions. Issuing certificate of fitness might lead to continued employment and economic activity at the peril of the affected mineworker and society at large through increased demand on the health care system. This will provide economic protection with no health promotion or protection. There is no mitigation of continued exposure to the harmful effects of silica dust, the inevitable progression of silicosis is accelerated. This might lead to accelerated full-blown silicosis with its complications like incapacity, failure of the mineworkers to continue economic activity, heath and financial burden to already impoverished and poorly resourced families and societies. However, these potential burdens on society may be prevented by removing affected mineworkers from underground risk work. Summarily, what my response demonstrates is that suppose the critic is right; that I have mischaracterized the normative principle to which the combination gives rise. In that case, on a risk/benefit calculus, it seems more beneficial to society (and to individuals) to remove mineworkers with early and mild silicosis from continuing risk work underground. Nonetheless, I have not mischaracterized this normative principle since a number of formulations of welfarism

and African view of solidarity exist, which equally emphasize the good of the individual or "think of the good of the community" as co-substantively dependent on the good of the individual, implying that the community's well-being can only be fostered through fostering the good of the individual. (Ewuoso and Hall, 2019)

Since welfarism has many formulations, another critic may contend that solidarity and welfarism cannot be combined in the way that I have in this project. Specifically, these two approaches have contrasting views. Welfarism being a Western theory that is well established, well defined and used globally as compared to the African theory of solidarity which is not well defined, not well understood and underutilised. Equally, welfarism is more individualistic than communal where equal good of all individuals are emphasized (as is the case with many consequentialist theories) contrary to African solidarity that is inclined towards communitarianism and puts more moral weight on societal good than individual interests. In response to this later potential criticism, I contend that both welfarism and African solidarity theories have more in common than the critic has outlined. Both theories are premised on achieving well-being and the good for not only individuals, but for society as well. Particularly, though there are formulations of welfarism that conceive of the same as individualistic, this individualism does not undermine the emphasis which the approach also places on society's well-being. Similarly, though African solidarity emphasizes communal good, nonetheless, this approach also contends that this is not to be realized at the expense of the individual good. The preceding makes the combination and use towards the resolution of my research question morally sound.

4.2.2 Should affected mineworkers be allowed to continue risk work?

Suppose I am indeed correct, and the approaches I draw on can be combined in ways that imply that we ought to foster the well-being and good of individuals, or that the rights of individuals ought not to be sacrificed for the good of society. In that case, a critic may still contend that this normative principle does not imply that mineworkers with early and mild silicosis ought not to be issued certificates of fitness to continue risk work underground. In other words, a critic may argue that I have misapplied the normative principle to defend my claim. Third parties cannot say for certain what is in an individual's best interest or what would promote their best interest. Those who are in a proper position to know what is in their best interest is the individual themselves. Suppose mineworkers who have early and mild silicosis consider working underground, despite their condition, to be in their best interest. In that case, a decision not to issue a certificate of fitness to them would be an instance of our failure to promote their wellbeing. There is equally another reason a critic may contend that I have misapplied this principle. Suppose the aim of the normative principle to which the combination of welfarism and solidarity is to promote and maximise individual wellbeing. In that case, failing to issue certificates of fitness for job continuity might yield the opposite to such an extent that it would have serious financial and economic implications for them. Health and stable financial income are two sides of the same coin since health is required to earn an income. In the same vein, healthy living requires money.

In response, I acknowledge that the critic is correct, that health is key to individual and societal productivity and needs to be prioritized in order to preserve and protect

economic well-being. Goude and colleagues have explicitly observed the impact of ill health in perpetuating poverty in communities and argued ensuring the health of individuals will play a vital role in mitigating against or preventing the damaging circle of poverty in the society (Goudge, et al., 2012, p. P.155). Suppose silicosis is a debilitating, progressive and incurable condition. In that case, it ought to be mitigated since poor or non-mitigation contributes to the growing circle of poverty. Concretely, we ought to minimise the impact of accelerated progression of silicosis. Suppose that can the realized. In that case, its impact on health and subsequent social and economic harm that can result would also be mitigated. We ought to promote the health of affected miners and protect them from severe illnesses, disability and early demise. We ought to afford them opportunities to continue living healthy for longer and be able to exist as economically viable individuals that can raise and support their families. In so doing, we will be protecting their families from fatherlessness, child-headed family situations and social instabilities. There are many other benefits of mitigating this debilitating condition. Particularly, mitigating silicosis is equally vital for other reasons. This will reduce the burden on the already overstretched health care system, as complications arising from advanced silicosis will further burden the healthcare system. Perhaps we may not be in the best position to determine what is good for mineworkers with mild and moderate silicosis. Nonetheless, the normative principle that I apply in this study has a similar implication with Kant's imperative to treat humanity whether in one's person or in the person of another always as an end and never merely as a means. Issuing certificate of fitness to affected health workers

seems to me to be using them as a mere means to profits and money. Non-issuance can be a way of respecting their personhood.

4.2.3 Violation Of Miners Right To Autonomy

Another critic may also point out that the decision to issue certificate of fitness to affected mineworkers sometimes is requested by these mineworkers. Suppose miners who have the conditions I have described request to be allowed to continue risk work underground. In that case, a failure to issue such certificate implies a failure to honour the miner's autonomous rights. Particularly, it violates their autonomous decision to elect to continue risk work underground. Mineworkers should be able to have a say in this life altering decision.. This is a key aspect of exercising their moral agency and respecting them as persons.

I respond by arguing that applying the principle does not in any way violate miner's autonomous right. Contrarily, it enhances it. Notice that currently, no alternatives are afforded to mineworkers with mild and early silicosis. In most cases, they have no other option, but to continue risk work underground. In this regard, the current situation does not respect or foster their autonomous capacities.

Most of them are equally unaware of the magnitude of the dangers of continued exposure to silica dust even after they have developed silicosis. It seems logical to me that if they were aware and alternatives are provided, they will elect not to continue risk work underground. One consequence of the thesis I defend in this project is that mineworkers with early and mild silicosis ought to have alternatives. In addition, they ought to be informed, educated and counselled about silicosis, its progression,

prognosis and health implications and the impact of this condition on them and their families. The exacerbating and mitigating factors to delay accelerated the progression of the disease need to be explicitly outlined to affected individuals. This is what will enhance autonomous decision-making. As argued by some scholars that every agent needs to control their own behaviour by making unforced choices while having knowledge of relevant circumstances (Haines, 1989, p 22274). The normative theory aims to protect and preserve rights and livelihoods and not violate them.

4.2.4 Compensation History and Miners' Difficult Choices

A critic may also observe that there is a long history of poor compensation for mineworkers, and this ought to matter morally. But the principle I advance fails to take this into consideration. As argued by Shula Marks, the poor compensation system has over the years compelled already affected miners to continue risk work, irrespective of the knowledge of the health implications involved (Marks, 2006). Other scholars like Richard Spoor have also observed that the compensation system under ODMA is hopelessly inadequate and inefficient. The benefit payable remains proportionally less than the magnitude of harm caused by silicosis to mineworkers and their families (Spoor & te Water Naude, 2020). The gold mining industry had in the past denied the impact of mining on the health of mineworkers and subsequently refused to take responsibility for the death toll and diseases caused by silicosis (McCulloch, 2009). There were initial racial discriminations in the compensation system where blacks were completely excluded, which also constitutes inadequacy in the compensation system (McCulloch, 2009). The situation in South Africa has not

changed much. What this implies is that mineworkers are better off continuing risk work.

In response, I acknowledge that the statutory compensation system, particularly in South Africa, needs to be overhauled. This is not sufficient. Suppose the new system is not implemented? Part of the aim of this project is to provoke critical conversations that need to be had on how to improve the ODMWA compensation system. Particularly, early and mild silicosis ought to be included as compensable condition in the Act. Additionally, adequate sustainable payable benefits must be integrated equally in the Act. I equally suggest that a body must be set up to implement and/or monitor implementation of the Act. Summarily, the health and well-being of miners and their families and societies ought to be seriously considered and implementable policies ought to be formulated to protect these.

4.2.5 Are There Security Concerns?

There are also security and economic concerns to consider. It might be argued that the impact that comes with the non-issuance of a certificate of fitness could have a huge burden on affected miners, who might resort to crime to feed their families. There is already a high unemployment rate in South Africa, with values ranging from 26, 91% in 2018 to current rates being as high as 33, 56%. Mineworkers are even in a more precarious situation, since they are often migrant workers from rural areas and neighbouring countries, who are uneducated and cannot compete for jobs in the formal sectors. Though criminal behaviours can be influenced by a number of factors than I cannot afford to explain in this chapter, nonetheless, joblessness and worsened

living conditions are other associated factors. Particularly, individuals will sometimes resort to crime as a measure of survival in the absence of jobs. Summarily, lack of adequate reasonable alternative accommodation on surface for miners with early and mild silicosis, non-inclusion of these group of miners in the compensation system, high unemployment rate and inadequate social services system in the country are some of the drivers compelling miners to choose continuing risk work underground (Marks, 2006). What this implies is that a failure to issue these certificates could lead to increased crime in the society.

In response, the reader should notice that the normative principle I apply here does not ask that affected mineworkers should be fired from their jobs. This may increase crime in the society. Instead, the normative principle I apply here implies that alternative arrangements ought to be made for affected mineworkers on the surface to continue non-risk work. In light of this, my main contention is that mineworkers can earn a living without necessarily exposing themselves to silica dust suppose alternative arrangements can be made for them on the surface. In fact, the normative principle implies that employers have this moral obligation not to expose their employees to conditions that undermine these mineworker's quality of life. Another critic may add that suppose there are no more places on the surface to accommodate more affected mineworkers? In that case, some affected mineworkers would be let go, and this may increase crime rate. At this juncture, I point out that even in this situation, early and mild silicosis ought to be classified as compensable conditions. My argument is that these affected mineworkers could resort to violence and crime. This ought not to be because no alternatives were provided for them.

4.2.6 The Impact To The Gold Mining Industry

It might be argued that not issuing certificate of fitness to mineworkers with mild and early silicosis might have a negative impact on the mining industry; strikes organized by unions being one of them. Strikes might impact the industry both economically and socially. Economically by halted or slowed productivity as workers embark on industrial actions. Socially as some workers might engage in violence, thus resulting in injuries and even deaths. These might have a negative impact on economic growth, investor confidence and lead to job losses.(Murwirapachena and Sibanda, 2014). Mining gold in South Africa is currently costly with deeper levels requiring expensive equipment. The industry is still prone to high accident rates that need to be minimized as well as silica dust exposure levels that is still posing susceptibility to silicosis and still need to be lowered. Hiring and training more underground miners would come at an additional cost. Suppose affected individuals are denied access to work underground to prevent the condition from advancing? This practice might also be met with resistance from affected mineworkers and the unions, thus leading to strike actions that could impact negatively on productivity. There might be increased labor turnover with an increased rate of hiring and medically boarding employees. More people in communities would be exposed to silica dust as the employment turnover increases in the gold mining industry. What this implies is that the long-term impact of failing to issue certificate of fitness appears to be worse than issuing the same.

I respond to this criticism by arguing that the mining industry needs to be prepared and take responsibility for protecting the lives and livelihoods of their employees. Based on the normative principle I apply, it is morally unjustified to further expose

mineworkers already affected, to silica dust underground where they face acceleration of disease progression and later be medically boarded (that is, dismissed owing to condition) when they are sick and unable to provide for their families. To avoid the impact which the critic describes, silica dust levels and exposure could be reduced further below the current levels. This recommendation ought to be taken seriously and fast tracked to protect mineworkers from developing silicosis, thus protecting their health and well-being and maintain stability in the industry.

4.2.7 Counterintuitive Outcomes

Another potential objection to the claim I advance may consider the likely consequence of the position I endorse as undesirable, and on a risk-benefit calculus, to be avoided. Particularly, a critic may point out that there are currently no known practicable alternatives in place. Thus, denying a certificate of fitness might leave mineworkers in more precarious conditions than they already are economically. A policy is desirable to the extent that it can increase the economic status and income of people. But my thesis statement would compromise the economic well-being of miners with early and mild silicosis in a way that contradicts what the principle stands for. It will compromise the main elements of the principles by failing to protect, promote and maximize the economic and social well-being of miners and their families, should they find themselves unemployed and thrown back to having lack of income and poverty. Applying the moral principle might therefore be judged as unreasonable. Moreover, the compensation system is selective, and early and mild silicosis are non-compensable conditions (ODMWA 78 of 1973).

I respond to this potential criticism that not issuing a certificate of fitness to continue risk work underground need not leave miners in a more precarious situation than they already are. There are means that employers can improvise to mitigate against the economic harm that this might give rise to. As an example, employers can provide adequate alternative accommodation on surface – where there are no exposure to silica dust – and reserve this to already affected underground mineworkers (who are exposed to silica dust underground but absent on surface). This group of mineworkers could be incorporated into other non-exposure mining projects on surface and off sites like gold beneficiation (a process of separation of minerals from the ore). My claim might necessitate a policy change and calls for incorporation of this group of mineworkers into the existing ODMWA compensation system. Nonetheless, continued exposure of mineworkers with early and mild silicosis is unethical and amounts to using these mineworkers as a means to an end.

4.3 Concluding Statement

I have in this chapter identified possible objections to my central claim, addressed and discussed them and ended each subsection by responding to what potential critics might be raised against my argument. I started the chapter by briefly giving account of the normative principle that I draw on before discussing potential criticisms to my claim. In the next chapter, I will conclude the project and suggest recommendations.

Conclusion

The aim of this project has been to argue against the morality of issuing a certificate of fitness to gold mineworkers diagnosed with early and mild silicosis to continue risk work underground where they are further exposed to crystalline silica dust. Continued exposure to silica dust leads to the acceleration of silicosis progression, increases the possibility of health complications, deterioration of respiratory capacity, incapacity and possible early demise.

While it is difficult to fathom the ethical reason behind knowingly allowing acceleration of disease, thus putting the health and lives of affected miners at risk, it is understandable that poverty and lack of alternatives can be an equal driving force behind mine workers to overlook the devastating and detrimental long term effects on their wellbeing and those of their families. On a balance of probabilities, health and life needs to be weighed against economic and social well-being. The only mitigating factor that can delay or prevent acceleration of silicosis is removal of already affected mineworkers from underground risk work. The health burden of silicosis and its complications is not only limited to individual mineworkers, but has the potential to spill over to their families and the communities, particularly by way of an exacerbation of already poorly resourced social and economic capacities. There is also a notable exacerbation of the already existing TB burden and increased burden to the already ailing public health care sector, especially in communities around the mines. I contend that there is no moral justification in allowing these group of mineworkers to continue risk work underground and that they ought not to be issued with certificate of fitness that permits that.

To defend my claim, in various chapters, I identified welfarism and combined this with the African view of solidarity to derive a normative principle for defending my central thesis statement. Specifically, I drew on objective welfarism and combined this with the African communitarian theory of solidarity, and in particular, the social formulation of solidarity. Objective welfarism is a Western theory that is premised on the notion of pursing a welfarist state of affairs where the good and well-being of individuals and groups of people ought to be prioritized. In this regard, an action is right to the extent that it can promote, protect and maximise well-being of individuals and group of individuals. The African communitarian theory of solidarity that I draw from share similar precepts with the objective welfarism theory that I described above. It places greater moral weight on pursuing good and well-being of others. It is more communitarian than individualistic where rights based actions are judged to be those that promote, protect and maximise the good and well-being of individuals and society. In the final analysis, outlined the specific normative principle that this combination gives rise to. The normative principle hypothesizes the notion that we ought to act in a way that prevents harm, but protect, promote and maximize the good and well-being of individuals and groups of people.

I further continued to describe the clinical aspect of silicosis in the section that followed, its prognosis and complications and the impact that this incurable disease can have on individuals, their families and society. This implies that the burden of silicosis is not limited to affected individuals, it stretches to affect their families and society economically and socially as well. The disease burden comes as a form of spillage of TB to communities, which leads to exacerbation of the existing heath

burden in poorly resourced societies. This leads to social and economic impacts as scares resources get overstretched, more people get infected, with loss of lives of economically viable individuals. This might further perpetuate poverty and social instability in communities, thus negatively impacting society. Furthermore, I discussed roles that stakeholders and different bodies play in limiting silica dust exposure and the burden caused by silicosis on mineworkers, communities and the gold mining industry.

In the last chapter I identified potential objections and criticisms to my central claim. I discussed these objections and ended the chapter by responding to them. To the objection that argued that I have mischaracterised the normative principle above, I demonstrated that suppose the critic is right that I have mischaracterized the normative principle to which the combination gives rise, contending that the normative principle that can arise from this combination would ask us to do what is good for society and the multitude. In that case, on a risk/benefit calculus, it seems more beneficial to society (and to individuals) to remove mineworkers with early and mild silicosis from continuing risk work underground. Nonetheless, I have not mischaracterized this normative principle since a number of formulations of welfarism and the African view of solidarity exist, which equally emphasize the good of the individual or think of the good of the community as co-substantively dependent on the good of the individual, implying that the community's well-being can only be fostered through fostering the good of the individual. (Ewuoso and Hall, 2019) I further showed the common values shared by both welfarism and African solidarity theories and that both are premised on achieving well-being and the good for not only individuals, but for society as well.

The combination of these two moral theories and their use towards the resolution of my research question is therefore morally sound.

To the objection that I have misapplied the normative theory that the normative principle does not imply that mineworkers with early and mild silicosis ought not to be given certificate of fitness. I demonstrated how issuing certificate of fitness to continue risk work underground further exposes them to the harm of silica dust which further accelerates progression of silicosis and predisposes to complications, incapacity and premature death. This is a precursor of social and economic burden to communities and the healthcare system, an impact that can be mitigated by non-issuing of certificate of fitness to mineworkers with early and mild silicosis, while taking their economic well-being into consideration as well.

In response to another objection which says that not issuing certificate of fitness to this group of mineworkers might leave them in a more precarious situation than they already are in. I demonstrated that this need not be the case as there could be alternative measures like incorporation of early and mild silicosis into the current statutory compensation system, and provision of adequate alternative surface employment to accommodate these group of mineworkers and non-exposure mining projects.

Another critic might argue that applying the principle is in violation of miner's autonomous right. I responded that some affected miners might be driven by lack of alternatives to opt for continuation of risk work underground in spite of the dire consequences to their health. Provision of adequate education and information of the impact of continued risk work in this instance and availability of alternative economic

sustenance might yield fair and informed autonomous choices. The normative principle therefore aims to protect and preserve rights and livelihoods and not violate them.

The preceding yields the conclusion that it is unethical to issue certificates of fitness to affected mineworkers. Specifically, it is ethically wrong to fail to protect this group of mineworkers from continued exposure where disease progression is accelerated and where the only mitigating factor against this acceleration is removal of affected workers from risk work under ground.

Nonetheless, some recommendations are necessary. In subsequent paragraphs, I outline a few recommendations that can be adopted by relevant stake holders and policy makers to address ethical issues in silicosis management in the South African mining industry. The study has raised an important awareness of issuing certificate of fitness to already affected mineworkers and the impact that this can have on them, their families and communities.

I recommend that policy makers and concerned stake holders should draft and implement policies that consider early and mild silicosis as compensable conditions. They can also draw on the study to promulgate laws that prohibit underground risk work continuity to prevent further exposure to already affected mineworkers.

Mining companies also need to realise the impact of continued exposure can have and need to take the health of their employees seriously. Hence, I recommend that they should create adequate alternative reasonable accommodation on the surface to cater for this group of mineworkers.

I recommend that the tripartite alliance, which constitutes of the Government, the employers and the mineworker's unions in the gold mining industry need to fast track their aim of lowering OEL to below the current non protective levels of 0,1m3/ mg as an urgent need to mitigate against continued exposure to silica dust, seeing that the disease is irreversible and untreatable.

I recommend a revision of ODMWA given that this Act has been identified not only as insufficient, but also not adequately inclusive. The Act classifies early and mild silicosis as non-compensable diseases. The study appeals to policy makers to first incorporate these states of silicosis into the compensation system. To make the compensation system more inclusive and sustainable in order to mitigate against the health and economic impact of this group of mineworkers.

There should be frequent workshops and training of relevant stake holders to monitor and improve compliance and the progress of effectiveness of measures that are put in place to mitigate Silica dust exposure and silicosis.

Health and safety workshops of employees, employee representatives and mineworker's unions and health and safety officials need to be emphasised for training and education on the importance of compliance with safety measures put in place, wearing of PPE, good housekeeping to reduce dust levels in the working areas and self-monitoring and reporting of any health concerns.

Mining inspectorate need to continuously conduct on-site inspection and monitoring compliance in the mines. Individual and surface sampling of dust need to be frequently measured and analysed to determine levels of silica dust exposure and to

monitor compliance. Continuous monitoring of processes is important as it provides information on how loop holes can be addressed to improve existing systems or how new measures and systems can be implemented to replace ineffective ones for the benefit of employees.

There is more work to be done, more reporting and more studies need to be conducted in the ethical management of silica dust exposure in the South African gold mining industry. There is always more room for improvement.

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