

**What are the Implications of Horizon Scanning Exercises for
the Management of Workplace Health**

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Definition of horizon scanning

Business faces an ever changing risk profile continuously to which each individual is exposed to different degrees. In order to identify and measure the magnitude of such risks requires a systematic approach to acquiring this vital information. One such technique is horizon scanning, defined as; "the systemic examination of potential threats, opportunities and likely future developments which are at the margins of current thinking and planning", (Department for Environment Food and Rural Affairs, 2010).

Horizon scanning can be used for different purposes, one of which includes the understanding of workplace health risks and the impact that these risks will have on the individual and the business. The identification of these risks allows strategic interventions to be implemented earlier rather than later, and in particular with regard to workplace health, being a preventative rather and a curative intervention. Therefore this purpose includes the development of future policies and strategies by creating an understanding of potential future stresses, (Defra, 2010). It also prepares organisations to react rapidly to changes in the environment and to provide the basis for further analysis of these risks to the business, (Brown 2007).

Emerging physical, biological and chemical risks to the health of the working population

The 27 member states of the European Union (EU27), has about 159000 fatalities attributable to work related disease each year, (European Agency for Safety and Health at Work; EN84, (2009). These diseases have their origins in chemical, physical or biological agents. The work-place at which these agents are found is forever changing due to new technologies, new chemical formulae, socio and economic influences and regulatory requirements. Horizon scanning forecasts these new and emerging risks using the Delphi method as explained in factsheets

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EN60,68 and 84; a 5 point Likert scale was used to rate the risks. The formation of a 'risk observatory' to 'anticipate new and emerging risks' is a common approach.

An 'emerging OHS Risk' is any risk that is both new and increasing. New means that the risk was previously non-existent; or a long standing issue that is now considered to be a risk due to new scientific knowledge or public perceptions. The risk is increasing if; the number of risks leading to the risk is rising; or the likelihood of exposure is rising; or the effect of the hazard on workers health is getting worse, (EN84). Annual economic costs of ill-health and sickness are estimated at over £100 billion in the United Kingdom.

Physical risks

Lack of physical activity; due to use of visual display units and long periods of sitting at workstations and travel. This inactivity has showed an increase in the prevalence of musculoskeletal disorders.

Combined exposure to Musculoskeletal Disorders (MSD's) and psychosocial risk factors; combined exposure to MSD's and psychosocial risk factors have a greater effect on workers health than a single factor.

Complexity of new technology and human-machine interfaces; such as the workplace hardware, ergonomic design and man-machine interface with associated information transfer, result in mental and emotional strain culminating in human errors and risk of accidents.

Multi-factorial Risks; These are jobs with multiple exposures such as prolonged sitting, noise, poor ergonomics time pressure and high mental and emotional demands, these result in many diseases and disorders including stress; e.g. call-centre workers.

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Insufficient protection of high risk groups against long-standing ergonomic risks; identified in areas of employment with low employment status and poor working conditions such as the construction industry.

Thermal discomfort; lack of measures against thermal discomfort (both hot and cold) and the effect on workers stress is not adequately assessed.

General increase of exposure to ultraviolet radiation (UVR); a growing need for protection both inside and outside of work; Inside of work could include photochemical dermatitis (American Conference of Governmental Industrial Hygienists, 2008. (ACGIH), caused by UV exposure to welding rays. Thus cumulative effects arise.

Combined exposures to vibration, awkward postures and muscular work; are traditional risks which have gained more attention due to the effects on health now recognised.

Biological Risks

Global Epidemics; new pathogens are emerging such as avian influenza which due to world travel can rapidly spread and cause a pandemic. Natural disasters have seen the emergence of cholera for example in Tahiti. World trade and travel has also seen the spread normally localised diseases to other parts of the globe, e.g. cerebral malaria (World Malaria Report, 2009)

Drug Resistant organisms; this has been mainly as a result of antibiotic misuse. Two examples in South Africa are multi-drug resistant tuberculosis and cerebral malaria, healthcare workers and migrating worker populations visiting areas which in the case of cerebral malaria have the vectors (anopheles mosquito) of the disease are most at risk.

Poor Risk Assessment; the inadequacy of effective biological risk assessment is lacking in South Africa although there is legislation that demands it. Due to the lack of knowledge and information these bio-hazards are largely

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poorly assessed. These biohazards are not well communicated to the exposed persons although legislation has a "right to know" duty imposed on employers.

Waste Treatment; Health problems associated with airborne microorganisms including mould, endotoxins and volatile organic compounds in the form of bio- aerosols have been observed to cause ill health to workers in this sector.

Combined exposure to biological agents and chemicals; this exposure type is difficult to determine what actually constitutes the health effect. Multiple chemical exposure is a bit easier, but as in the case of bio aerosols the route of exposure for example could be a biological agent carried by a chemical agent that if inhaled would be deposited in the various areas of the respiratory tract. Each having its own effect, but in combination may result in enhancing the overall health effect. Humans are repeatedly exposed, day after day, to a wide variety of such material.

Indoor air quality; This is as a result of the combination of chemical, biological and physical agents in the indoor work environment that may come from the external environment or generated within the internal environment. Examples are moulds, microbial load e.g. carpet mites, or chemicals from glue etc. It is also closely linked to ventilation systems.

Lack of Maintenance of water and air conditioning systems; microbial growth in these systems does result in indoor health problems. The larger air conditioning systems have an external water cooling section which if not treated correctly results in contamination throughout the system. An example of this is legionnaire's disease. Depending on the local climate, the maintenance requirements change as does the monitoring for such organisms.

Endotoxins; result from organic sources and is found in the agricultural and livestock sector, biological research laboratories, indoor workers and waste and sewerage work environments. Effects are diverse and are associated with

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each specific endotoxin type and may include allergies, chronic and acute health effects, asthma like symptoms or occupational induced asthma, organ damage and death.

Chemical Risks

Nanoparticles; identified as the greatest risk, as little research has been done on these particles and the effect on health once it enters the body. Indications show that they can cause cardiopulmonary, toxic and autoimmune effects amongst others. The need for further research into these particles is demanded, The Council for Scientific Industrial Research (CSIR) in South Africa is to spearhead research into nanoparticle technology and risks.

Diesel Exhaust; resulting from all diesel engines. The chemical makeup differs due to grade, e.g. 50ppm to 500ppm sulphur content. Emissions could include benzene, nitrous oxides, carbon monoxide/dioxide among others which make up the "diesel exhaust fume cocktail" that is probably carcinogenic to humans, (International Agency for Research on Cancer, 2010).

Man-made mineral fibres; these man made specific use fibres are possibly carcinogenic but further research is required. What is evident though is that the inhalation of such particles due to the length to width ratio are deposited in different regions of the lung, the smaller and thinner are deposited in the alveoli where the gas exchange region is, and thus increases inflammatory, cytotoxic and carcinogenic potential.

Allergic and sensitising agents; epoxy resins are continuously being developed, hardening properties and faster drying properties required by industry results in "a continuous chemical evolution" taking place. Associated with this is the ever-changing chemical hazard profile and associated health risks. This affects both the construction and plastics industry.

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Isocyanates; used in the paint industry, manufacture of foams and are strong sensitising agents that can irritate the mucous membranes. Dermatitis and skin inflammation can occur due to skin contact.

Dermal Exposure; skin being the first line of defence and the largest human organ exposed to chemicals is the area that skin diseases are seen, in the EU chemicals cause 80-90% of occupational disease. Dermal exposure is noted in the ACGIH 2008 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, however more research is required.

Carcinogens, mutagens and reproductive substances (CMR's); Cancers due to occupational exposure to existing and new agents are possibly the main cause of death in the EU, and possibly other regions of the world which is under researched. Agent types among others are asbestos, benzene, hard wood dusts silica, (IARC, 2010).

Sector specific chemical Risks; Sectors identified as having higher illness rates includes the construction and waste treatment sectors. Chemicals such as heavy metals, VOC's, respirable dusts and polychlorinated bi-phenols are found in these sectors. Control strategies need to be implemented after valid monitoring in both of these area's of concern.

Combined Risks; poor control of mixed chemical exposures together with psychosocial risks has been identified in SME's as a increasing concern. Subcontracted workers in the cleaning industry have been found to be less informed of the risks and therefore more vulnerable.

Emerging psychosocial risks to the health of the working population

Emerging workplace health risks are different per continent depending on the particular situation that a country faces. Horizon scanning for Europe has identified psychosocial risks that are particular to that region. In other countries psychosocial risks have not received the attention that they should have.

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Forecasts regarding psychosocial risks by experts representing the European Union, the USA and the International Labour Organisation are all similar. What is evident is that workers health is at risk because of factor related to work related stress. A horizon scanning exercise done at the South African Institute of Occupational Safety and Health (SAIOSH) conference in October 2010 is include, which identified new and emerging risks somewhat different from factsheet EN74, although there are also similarities.

Psychosocial Risks

In Factsheet EN74, research found that emerging psychosocial safety and health risks were often as a result of technical or organisational change, socio-economic factor or demographic and political changes. Globalisation was also found to be a significant factor.

Job Insecurity and New forms of employment; contract workers often carry out the most hazardous jobs, work in the worst conditions and traditionally receive less training and education. These finding where echoed in the SAIOSH horizon scanning exercise but ranked 4 and 5 respectively, see Fig 1.

Work Intensification; workers dealing with larger amounts of information, higher workloads and more demands impact on workers. This is reflected in the SAIOSH survey with identified risks relating to Employee retention (ranked 3) and lack of a skilled workforce (ranked 1). The effects of the organisations management approach was ranked 9th.

The aging workforce; Europe's workforce is an aging workforce with higher retirement ages. The aged workforce is more affected by workplace hazards than younger employees. In South Africa, the life expectancy at birth for males is 53,3yrs for males and 55,2yrs for females, and is estimated to be 50 years by 2015, the lowest since 1955. This is certainly linked to HIV infection, as almost a third of all deaths each year are attributed to AIDS related deaths, estimated at

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281404 for 2010 (Statistics SA, 2010). The SA problem is that the workforce is dying younger, reducing skills and is reflected in the drop in the population growth rate from 1.4 in 2001 to 1.06 in 2010. HIV was ranked 10th in the survey. Therefore this has a biological / psychosocial synergistic effect.

High Emotional Demands at work; this has been highlighted as a concern. Bullying at work has been identified as one of the factors contributing to the high emotional demand at work in the EU. Violence and bullying at work affects all sectors and results in stress affecting both mental and physical health. In the SAIOSH survey, bullying was ranked last (Mean Value 3.17), however other studies in South Africa have found the opposite. The effect of crime on workplace stress was ranked 7th, MV = 3.53. This is not totally surprising as South Africa per capita has the highest murder rate and the highest rate of rapes in the world, (NationMaster, 2010).

Poor Work Life Balance; the boundaries between work and non-work is difficult to separate. The effects on workers health can be attributed to long work hours, high workloads, inflexibility of working times, uncertainty in the workplace, and family commitments. In the SAIOSH survey long work hours ranked 8th MV = 3.49 whilst, work-life balance ranked 6th, MV = 3.64.

An area that was ranked 2nd (MV = 3.85), as a psychosocial risk in the SAIOSH Survey was *Affirmative Action*. This is an area that is of greatest concern amongst mainly white South Africans and especially white males. In J.W.M. Coopmans research project in 2007, he concluded, " black managers appear to be alienated from feeling responsible for productivity, while white managers appear to work under fear-based motivation due to affirmative action measures imposed on the workplace". It also partially accounts for the 440000 whites (Stats SA 2010) that have immigrated to the UK, New Zealand and Australia, stating that this is coupled with the high crime rate. This "brain drain" has caused the government to run campaigns to get the skills back into South Africa. It has not

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been successful, and is one of the factors that have lead to the skills shortages, longer working hours, and greater demands at work. The government skills development programme has collapsed as have the administration of the Compensation for Occupational Injuries and Diseases Act, the last report was issued in 1999.

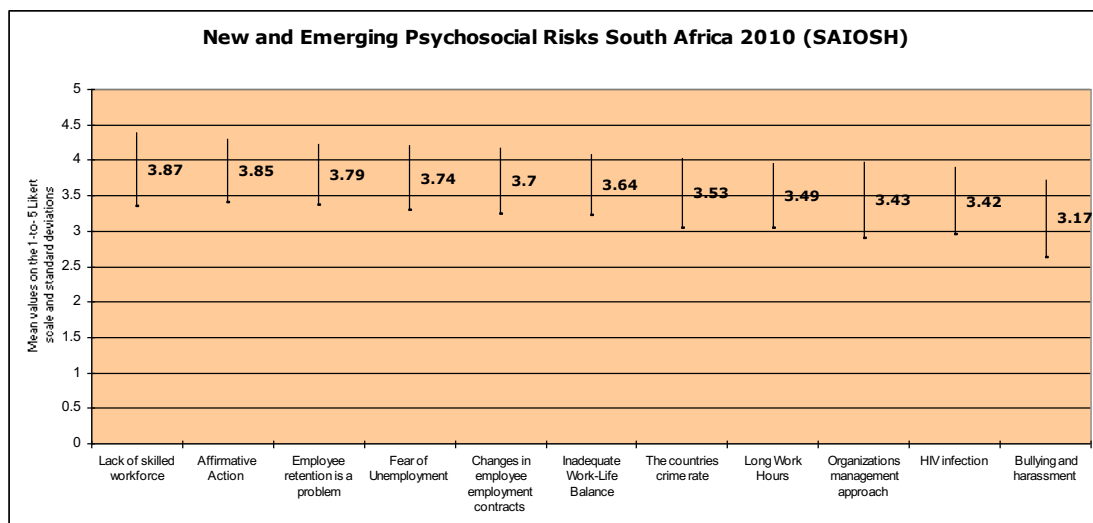


Fig 1

(A questionnaire was administered to 90 participants at the conference, 48 were returned of which one was spoiled, 52% response rate. The participants were all told that completion of the questionnaire was voluntary, confidential and to be placed in a sealed boxed at the back of the conference centre. English was used as the communication medium, however home first languages were not ascertained, there are 11 official languages in South Africa. The box was removed at the end of each day. The Likert scale was used, the mean and standard of each question was calculated. The participants were made up of HSE practitioners and associated professionals, 85% of the participants had more than 8 years of experience, 75% had post school qualifications, minimum of 3 years study, and all tertiary studies are in English).

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Although limitations regarding the sample size and focus group are noted, the results of the SAIOSH horizon scanning exercise emphasised the uniqueness of a particular group's perspective when it comes to new and emerging risks. The highest ranked risks are; lack of a skilled workforce (MV=3.87), affirmative action (MV=3.85) and employee retention (MV=3.79). Although this is not surprising in a country that has seen skills leave the country coupled with a high murder rate and over 40% of deaths attributed to AIDS complicated diseases, employers are therefore prepared to pay a premium for such skills. These premiums include retention bonuses, share options and 13th and 14th cheques, some company's offer signing on bonuses. Job hopping is common in South Africa. Job insecurity (4) and changes to employee employment contracts (5) are seen in terms of the global economic down turn. Ranked 6th was inadequate work-life balance and long work hours (8), these are seen in the context of lack of skills, and employee retention. The need to "pick up" the work for those that are "job hopping" exacerbates the work life balance problem. Interestingly the countries crime rate was ranked 7th (MV=3.53). It demonstrates the effect the country's crime is having on the workplace, and is seen as having a much larger effect than workplace bullying and harassment (11). This must be seen as a national concern and some workplaces have set up post traumatic stress disorder counselling centres for those who have been car-hijacked in the course of their work. The organisations management approach was ranked 9th, and HIV infection (MV=3.42) 10th. SA mortality is estimated to have over 281000 AIDS related deaths (over 1/3 of total deaths) in 2010, new infections of over 410000 is estimated for 2010 (Statistics SA 2010), it is therefore not surprising that it is an emerging biological risk and is associated with psychosocial risks in the workplace as a stressor.

What is not in doubt is that the number of psychosocial risks far outnumbers the other categories of risk. The highest risk factor as a physical risk is work

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related driving, but it is unclear if this is associated with hi-jacking of motor vehicles, Fig 2.

Description of the construction sector

Construction in South Africa is one of the larger industries. The majority of its participants are small, medium and micro enterprises, (SMME's). These SMME's employ 64.7% of the estimated 540581 people, 69% have permanent employment (Statistics SA, 2007). Only 10% of this total workforce is female, considering that 51% of the total population of 49.99 million is female, (Statistics SA, 2010) it is a very small percentage. Total income in 2007 was R169249million. This sector is experiencing a high rate of job losses, in the second quarter of 2010 this sector contracted by 7.1% or 54000 jobs, (Statistics SA, July 2010). The national number of job losses for the past year amounts to 627000. Unemployment rate of economically active population is 25.3%.

The larger construction company's cover all of South Africa and neighbouring countries such as Lesotho and Mozambique. The smaller company's tend to remain within their province and some only work within a particular municipal district. The construction industry relies heavily on manual labour whilst the larger or specialised organisations are a lot more mechanised. Those workers termed general labourers are mostly from a poorer and lower educated background and face the largest challenges in this industry. They are migrant employees when it comes to work, but of late it has become legislated that at least 60% of the workforce must be sourced locally to the particular worksite. This still results in challenges to the majority of workers. The country's infrastructure is typically that of a developing country, and therefore many hours are spent travelling to and from work. It is not unusual for persons to awake at 03:00am to get to work at 07:00 in the morning, then travel home after a nine hour day. The construction industry workweek is 45 hours. Overtime is common

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in the construction industry, and on many projects 12 hour days are the norm, legislation permits this to run for 12 days followed by a 72hour work break, (Basic Conditions of Employment Act, 1993).

Government policy requires that company's can only be awarded state contracts if criteria are met with respect to the complement of black persons in the organisations at each level; this is termed BBBEE, (Broad Based Black Economic Employment). This has placed a burden on the free market system and often relies on poaching of black skills from one employer to the next.

This industry is governed by the Construction Regulations framed under the Occupational Health and Safety Act, Act 85 of 1993 and, the Compensation of Occupational Injuries and Diseases Act. A commissioned report by the Construction Industry Development Board (CIDB) undertaken by Smallwood, Haupt, Shakantu, (2009), describes the construction industry in relation to health and safety further; "at the organisational and site level, poor construction health and safety performance is attributable to a lack of management commitment, inadequate supervision and inadequate or lack of health and safety training. A lack of worker involvement, personal risk appreciation and work pressures also contribute to poor performance". The work pressures mentioned is not expanded on in terms of for example psychosocial risks or resulting workplace stress factors, nor does any of the abovementioned legislation recognise work related stress.

Emerging risks in the construction sector

Emerging risks in the construction industry may be categorised as biological, chemical, physical and psychosocial. Emerging risks identified in both the SAIOSH 2010 horizon scanning exercise and in Europe and the USA do have similarities. South African emerging risks in the construction industry do have a few other unique risks. In the USA, the National Occupational Research Agenda (NORA), priorities include addressing construction safety and health management,

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organisation, vulnerable workers and construction culture issues among others.

The figure below portrays the emerging risks identified in a horizon scanning exercise in 2010.

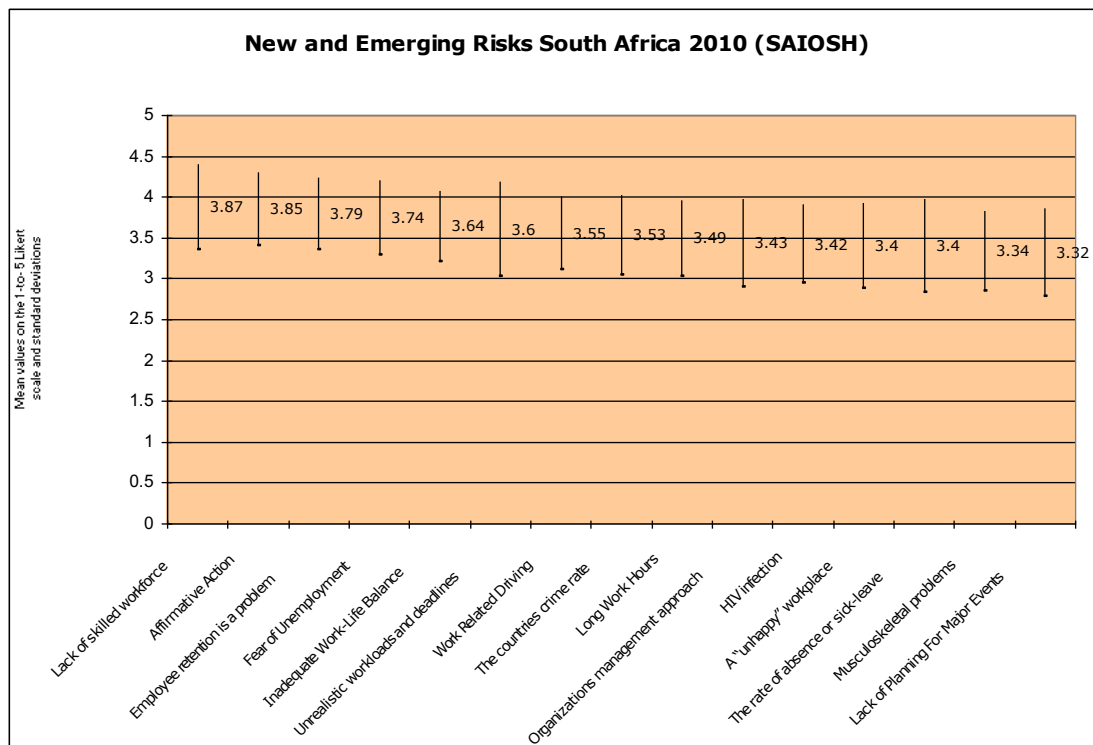


Fig 2

What is interesting is that Bulling and Harassment and Common Mental Health problems in the workplace were not seen as new or emerging in the South African Workplace, a previous internet survey in 2000 found that 77.8% of South Africans said that they experienced some form of victimisation during their careers, workplacetrauma.org. (2000). It is however believed by this researcher that these two areas require further research.

Interestingly, an "unhappy" workplace is identified, ranked 7th, an area for further research. It further demonstrates that this is an area where the organisational culture would possibly have to be addressed. Musculoskeletal risks are a concern although not as highly ranked as in the EU27. Very little research

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has been done regarding new and emerging risks in the South African Construction Industry. The South African Construction Industry is still focused on addressing the high number of fatalities and disabling injuries that occur. The number of lost workdays due to absenteeism and in particular to stress is not available for the construction sector in South Africa. The total estimated cost to construction is still not determined, however the Federated Employer's Mutual Assurance company reported that direct costs of R116 million (£11 million) were claimed in 2007. This however only includes what can be claimed for in terms of accidents and specific diseases. The economic losses due to work related stress and ill health nationally is not available as work-related stress is not recognised in South Africa. Direct and indirect costs however has been estimated at 2% of construction spend, R3.5 billion, (Smallwood 2009).

The management of emerging risks in the construction sector

As stated by Smallwood, J (2009), "while overseas information is relevant to the South African construction industry, there is a need to adapt or supplement this information for local conditions and to promote this information locally".

The construction sector in South Africa is challenged with respect to the prevalence of HIV infection, malaria and tuberculosis. It further faces a high rate of job losses, lack of training and expertise, crime, and a poor health and safety record. Addressing these issues with a management plan requires both government and industry to assess the risks economically and in terms of health and safety. The International Labour Office, 2010 aptly states, " a national preventative safety and health culture is: "one in which the right to a safe and healthy working environment is respected at all levels, where governments, employers and workers actively participate in securing a safe and healthy environment through a system of defined rights, responsibilities and duties, and where the highest priority is accorded to the principle of prevention". Prevention

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relies on early intervention as mentioned in the Black report, and is especially relevant in the context of HIV and other biological risks in South Africa. The real question is what needs to be managed in the South African construction sector with respect to new and emerging risks. Little research has been done in this area. The real need for extensive research is of extreme importance, guidance from international bodies and international research findings can be used as a catalyst for meaningful and purpose driven research in this economic sector. The prevention of some of the major biological risks such as HIV, tuberculosis and malaria is undertaken, but sadly in terms of AIDS related deaths it is clearly not enough. The South African Health Minister Aaron Motsoaledi, in *The Sowetan* (2010), stated that 35% of all workplace absences is related to AIDS complicated diseases.

The evidence for acceptance of psychosocial risks is clearly lacking in South Africa and requires a national strategy of accepting that workplace stress exists and is caused by determinants such as job insecurity, long working hours and nature and change of work contracts. The MD of the Federated employers Mutual (FEM) stated; *"COIDA does not compensate for workplace stress. Unlike all the other injuries and diseases it is my understanding that it is impossible to ascertain medically where the stress has emanated from due to numerous factors that contribute to the condition. Also some individuals are genetically more prone to stress than others. FEM follows the ACT and I am not aware of any considerations to include workplace stress as a compensable disease by the Fund for reasons outlined above"*, (Thelma Pugh, personal communications, December 9, 2010).

The sad reality exists that if not legislated in South Africa, very few private companies will implement management controls. The public sector cannot manage workplace stress as it is not recognised in terms of South African labour or health laws. Management and prevention in South Africa rests at this time with

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moral and ethical considerations, the need for change rests with ensuring that research and the promotion of findings is championed nationally to government.

**Current and emerging health risks in the construction sector:
implications for action**

The South African Construction Industry has a workforce that is plagued by both current and emerging stresses, some common with others in Europe whilst some unique to South Africa. The construction sector is an important economic area for South African development which if not managed correctly will result in the contraction of growth. This sector is already under tremendous pressure with respect to the lack of skills, the current economic climate, HIV, a poor health and safety record and biological risks. The economically active and skills pool from which construction can get skilled human resources is ever shrinking, and is reflected in the declining population growth rate.

The construction industry together with government need to accelerate national, regional and local interventions in the area's of;

- Skills Development and Training
- The abolishment of affirmative action policy
- Creating a safer climate free of crime
- Assessing and supporting SMME's health and safety systems
- Accelerating HIV and other biological risk intervention programmes.

Skills Development and training

This area is critical from a number of aspects, firstly from reducing stress resulting from this shortage and from an economic viewpoint. These risks should be addressed through learner-ship programmes, mentoring of identified in-house individuals, inclusion of health and safety modules in academic courses e.g. civil engineering that historically does not address these issues, and ensuring that

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employee's are trained and made aware of the particular risks to which they are exposed in the course of their work. The first line management within these organisations should be trained to be able to manage the risks identified in the risk assessment particular to that organisation. Providing these management tools are essential to keeping and developing a skilled workforce.

Abolishment of affirmative action policy

This is a legislated national policy which must be addressed by leaders of all businesses. It necessitates the action of the Chamber of Business and the Black Manager Forum to approach government with facts regarding the implications of not addressing these problems. The stress associated with this emerging risk cannot be addressed solely in house as the cause is due to national policy and, until it is changed, it can only be partly managed. Political statements such as those by the leader of the ANC youth league regarding nationalisation of the economy at the 99th ANC anniversary celebrations, "we cannot accept the economy being in the control of white males", does not help the problem, (Stolley, 2010).

Creating a safer climate free of crime

This is a further area that requires national attention. The construction industry is affected with regards to a variety of crimes, and the need to continue providing post traumatic stress disorder counselling needs for those affected. Unconfirmed research indicates that employee's feel safer at work than in their home environment, this is an area for further research. The effects of crime on stress levels in the company is evident, and management approach to the effects it has on workplace health and productivity needs to be addressed by awareness programmes, e.g. what to do if you are hijacked?

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Assessing and supporting SMME's health and safety systems

The construction industry has the an increasing fatality rate, in 2004/5 the number of fatal accidents was 54, in 2007/08 it had increased to 162, (Smallwood, J *et al*). The larger more established organisations have mostly effective health and safety systems, but the smaller often sub-contracted company's, have very little or no health and safety systems. The larger players in the construction sector together with the Construction Industry Development Board (CIDB), have a perfect opportunity to assist, develop and promote together with smaller business the requirements of health and safety legislation and how to practically implement it within there organisations. Incentive schemes rewarding good occupational health and safety results that reduce ill-health and accidents should be rewarded, benefits of this approach has been demonstrated, (EN95).

Accelerating HIV and biological risk intervention programmes

HIV is no doubt a national catastrophe. The statistics alone indicate that the effects on workplace health are alarming. The intervention of the construction industry by running training and awareness workshops for all of there employee's is of utmost importance. The health and safety practitioner can play a pivotal role in HIV and should be the focal point for driving this initiative. The construction sector cannot rely on government intervention alone. Government must further support and provide research funds. The continued support of Antiretroviral Treatment (ART), must be supported by the construction industry by providing the means to get this medication.

Implications of failing to act on the above new, current and emerging risks are already a cause for concern, exacerbated by national policy and laws not recognising work related stress.

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