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Mine Medical Professionals Association (MMPA)

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From the Editor . . .



Gill Nelson,
Editor-in-Chief

In this issue, Fourie and colleagues present a case report of a dermal reaction to nitrile rubber gloves in a laboratory worker. Nitrile gloves are often used as a substitute for latex gloves in a number of industries, but reports about allergic responses to latex gloves far exceed those related to nitrile gloves.[1] I recently attended a course in the Netherlands on human exposure assessment, where I learned how even the supposedly most innocuous things to which we intentionally expose ourselves, on a daily basis, are potentially hazardous to our health – cosmetics, household cleaning agents, etc. Substituting one hazardous substance (or type of gloves, in this case) does not guarantee 'safety'.

The paper on farm workers, by Mhlanga et al., and the one on workers who repair and maintain South Africa's electrical distribution network, by Qwemeshe et al., bring to mind the effect of climate change on workers who are required to spend much of their time outdoors. Climate change, driven by global warming, results in extreme weather events such as shifts in temperature, altered precipitation patterns, and increased frequency and intensity of extreme weather events.[2] Global warming is anticipated to exacerbate the health hazards associated with various weather conditions in outdoor occupations.[3]

Global warming contributes to an overall increase in temperatures, leading to more frequent and prolonged heatwaves. Working in high temperatures is associated with heat exhaustion, heatstroke, dehydration, and fatigue, and excessive exposure to UV light causes sunburn and skin cancer. Outdoor workers who already face the risks of heat-related illnesses will experience heightened dangers as the intensity and duration of extreme heat events rise. As temperatures rise, the geographic range of disease-carrying vectors, such as mosquitoes and ticks, may expand, increasing the risk of vector-borne diseases for outdoor workers.

Climate change is linked to an increase in the frequency and severity of extreme weather events, such as storms, tornadoes, and heavy rainfall, as also experienced in South Africa.[4] Outdoor workers may face higher risks of injury and exposure during these events, which include flooding, landslides, and other weather-related disasters. Strong winds are hazardous for those who work at heights, and also increase the risk of injury from flying debris; while wet, slippery surfaces increase the risk of falls, and prolonged exposure to damp conditions contributes to dermal and respiratory problems.

With climate change comes an increase in the frequency of wildfires and increased levels of air pollution. Outdoor workers may thus be exposed to increasingly poor air quality, leading to respiratory and other health issues.

In a review of research on the impacts of climate change on occupational health and safety, Ferrari et al. (2023) reported that the majority of articles (approx. 86%) focused on rising temperatures, while only a few addressed other effects of climate change such as air pollution, vector-borne diseases, and extreme weather events.[5] Most of the papers also focused on agricultural and construction workers.

Some recommendations to mitigate the health and safety risks associated with outdoor work are to train workers to recognise and appropriately respond to weather-related hazards, to provide personal protective equipment (PPE) such as suitable quality clothing, sunscreen, and hydration kits, and to allow flexible working schedules to enable workers to avoid extreme weather conditions. Where appropriate, shelters should also be provided.

However, outdoor workers in the informal sector, and those working in small and medium-sized enterprises (SMEs), may remain susceptible to the consequences of climate change. These vulnerable groups should not be neglected in strategies designed to reduce the health and safety risks associated with climate change.

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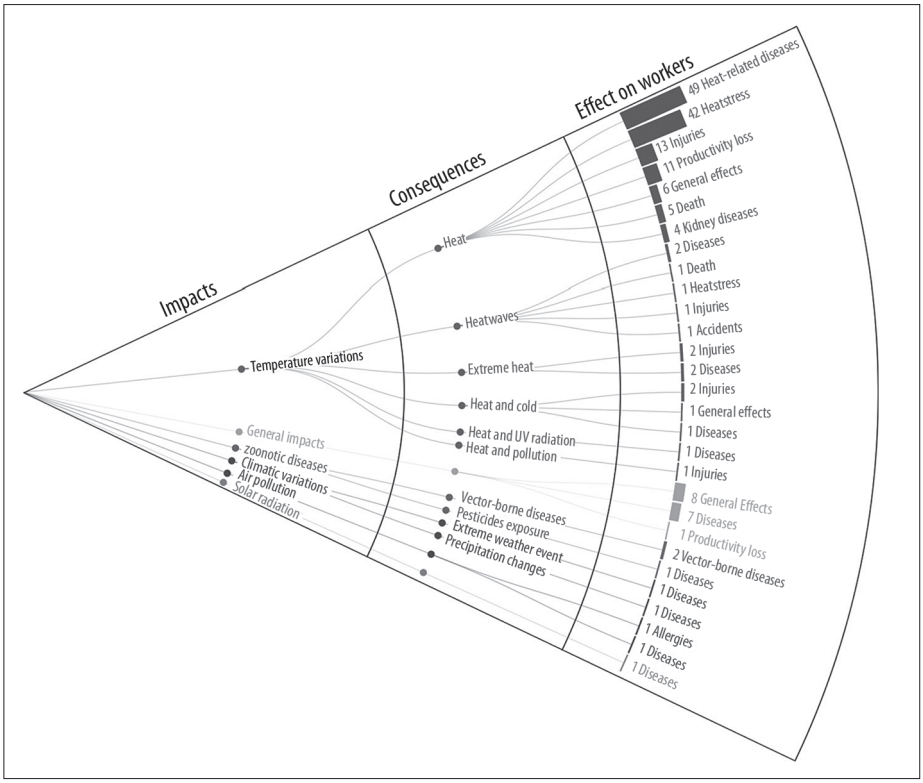
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Climate change's impacts, consequences, and effects on workers
Source: Ferrari et al., 2023[5]

Tshiamiso Trust Medical Reviewing Authority not transparent

I refer to the article in Vol. 29 Issue 3, 2023 published in *Occupational Health Southern Africa* on behalf of the Tshiamiso Trust: 'Tshiamiso Trust Reviewing Authorities commence with their dispute resolution function'. https://www.occhealth.co.za/_assets/articles/350/2440.pdf

May I politely point out that the Medical Reviewing Authority (MRA) is a clandestine body whose members are a secret. This makes peer review most difficult, and it is further complicated by the fact that the MRA does not provide detailed reasons for a finding against a former worker. For example, it simply states, *"no silicosis or respiratory impairment",* without providing the radiological diagnosis in accordance with the ILO International Classification of Radiographs of Pneumoconioses (1/0, 0/0, 2/1, etc.), and/or the spirometry result, e.g. FVC = 65% of predicted.

This makes an appeal for review of the findings by an occupational medicine practitioner most difficult. The legal opinion that we have obtained is that this is a violation of the Promotion of Administrative Justice Act, but the workers cannot afford to take the matter on legal review.

I welcome the Tshiamiso Trust's answer to the above issues.

Dr Rhett Kahn
MBBCh, DOH, DTM&H (Rand), DGG, DGA (Pta)
e-mail: rkahn@icon.co.za

The Editor of Occupational Health Southern Africa *gave Tshiamiso Trust sight of this letter, after which the names of the medical practitioners serving on the Medical Reviewing Authority (MRA) were published on its website. We acknowledge that Prof. Rodney Ehrlich is very respected in the field of silicosis, as is Prof. Rajen Naidoo. However, Prof. Naidoo is listed as a consultant on the Tshiamiso Trust, which is not reflected in the Trust Deed. It is noted that Dr Audrey Vukosi Banyini also serves on the Medical Certification Panel – the decisions of which are reviewed by the MRA.*

Tshiamiso Trust responds

Thank you for giving the Tshiamiso Trust the opportunity to respond to the letter submitted to you by Dr Rhett Kahn. The Trust Deed authorises the Trustees to appoint a qualified medical practitioner with experience in the evaluation of respiratory impairment and occupational lung diseases to fulfil the dispute resolution role of the Medical Reviewing Authority (MRA).

The MRA comprises of the following registered medical practitioners:

Main members:

- Dr Audrey Vukosi Banyini
- Prof. Rodney Ehrlich

Consultant:

- Prof. Rajen Naidoo

The names of the MRA and the Certification Reviewing Authority are now published on the Tshiamiso Trust website.

As per the Trust Deed, the MRA reviews the Certificate of Medical Finding, the Medical Report to which it relates, and ancillary documentation, and may consult with one or more medical practitioners, including the Accredited Practitioner who issued the Medical Report, and the medical practitioner (or practitioners) who constituted the Medical Certification Panel that issued the Certificate of Medical Finding. When the MRA adjudicates a dispute, they review the detailed Medical Report, which includes the chest radiograph and spirometry result. This ensures a thorough and fair process.

The determination of the MRA in each case is final and binding on the Disputing Claimant and the Trustees, unless the Trustees determine that the MRA has clearly and manifestly misapplied the principles for determining diagnoses, and the criteria for Qualifying Diseases, contained in Schedule H, in which event the determination shall be referred to the MRA for reconsideration. The Trust Deed does not stipulate an option for a review on appeal by an external occupational medical practitioner.

The certificate issued to claimants outlines the criteria not met by the mine worker which resulted in an ineligibility certification. Claimants can request access to any records, including medical records held by the Trust, should they need a view of the details. The request must be made in terms of the Promotion of Access to Information Act, 2000 (PAIA) using the prescribed Request for Access to Record form (Form 2), which is to be completed and submitted to the Information Officer at paia.requests@tshiamisotrust.com.

We remain committed to ensuring that all eligible mine workers receive the compensation that is due to them, seeking to give claimants the best chance of a positive outcome, within the confines of the Trust Deed.

Yours sincerely
Dr Munyadziwa Kwinda
Chief Executive Officer

Tribute to Professor Peter Adrian Leggat 1961–2023

Mary Ross and **Albie de Frey**

It was with profound shock and disbelief that we learned of the death of our colleague and friend, Peter Leggat, following a stroke and heart attack in Brisbane while travelling home from a Sydney conference in September. A mere two weeks previously, he had retired from James Cook University after 30 years of service, as Professor Emeritus and Director-Emeritus, World Health Organization (WHO) Collaborating Centre for Vector-borne and Neglected Tropical Diseases. The reality dawned during his online funeral at which his close colleagues described his tremendous contribution to medicine, nationally and globally.



Prof. Peter Adrian Leggat
Photograph: courtesy of Prof. Mary Ross

We first met Peter in 1998, while he was conducting research in Mpumalanga and we were planning a travel medicine module for the MSc in Epidemiology and Biostatistics at the University of the Witwatersrand (Wits). The course started in 2000 in collaboration with James Cook University in Townsville, Australia, and the South African Department of Health, which sought training to license providers of the yellow fever vaccine in South Africa. Peter came to South Africa regularly to present the lion's share of the course content based on the textbook that he wrote to train general practitioners in Australia and New Zealand. Subsequently, he served as the external examiner for the Wits postgraduate short course organised by the South African Society of Travel Medicine.

Over the last two decades, Peter was not only a generous source of wisdom, but was also an unassuming, convivial companion with whom we shared great fun in our many escapades related to our course and the many International Society of Travel Medicine (ISTM) conferences that we all attended. Outside of collaborating on presentations and workshops, our pleasurable adventures centred on food, sightseeing, and shopping on a shoestring around the globe in Geneva, Montreal, Shanghai, Lisbon, Edinburgh, New York, and Basel, plus Brisbane, Melbourne, Cape Town, and Gqeberha in our home countries.

One of the memorable course-related experiences entailed teaching in the Western Cape. Since the host organisation could not provide assistance for the course, Peter and our team had to use all our booked-in luggage allowance to transport 100 kg of paper notes, with only carry-on bags for our personal belongings. Finally in Stellenbosch, we spent a night sorting out the 120 files. The next day, Peter and Mary trudged in the searing heat to buy the last four flip-chart markers left in the city's stationery shops, and find the one-and-only photocopy outlet. Despite his jet lag, Peter endured these setbacks with his typical good humour.

Peter's CV demonstrates his academic and research accomplishments, and personal accolades, to which most of us can only aspire. At the age of 30, Peter became a Founding Fellow of the Australian College of Tropical Medicine, to which, as President, he honoured both of us with honorary fellowships soon after we established the Travel Medicine Course in South Africa. In addition, he established and became Deputy Editor-in-Chief for the Australian College of Tropical Medicine journal, *Tropical Medicine and Infectious Disease,*

''Sometimes you will never know the value of a moment until it becomes a memory."

-Dr Seuss

for which we are both members of the editorial board. In recognition for his exceptional assistance in establishing travel medicine in South Africa, we contributed to his being acknowledged through a Fellowship of the College of Public Health Medicine (SA), a Fellowship of the Faculty of Public Health (UK), and as Visiting Professor to the University of the Witwatersrand.

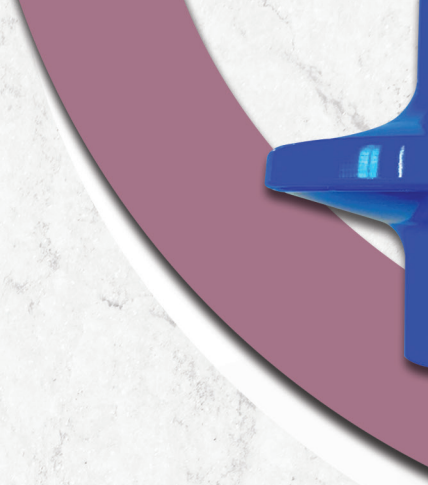
As an academic researcher, Peter published more than 500 journal papers (with more than 9 000 citations), including several in *Occupational Health Southern Africa*. He also wrote more than 100 book chapters and 30 books, and presented in excess of 400 papers at national and international conferences. He was Immediate Past President of the ISTM, a member of the Australasian Public Health Medicine Council, and a member of the Expanded Board of the International Federation for Tropical Medicine. Peter was also a medical officer in the Australian Army, a colonel in the Australian Defence Force, and an honorary aide-de-camp to the Governor-General of Australia. His exceptional service to the community was recognised by many prestigious awards such as recognition as a Member of the General Division of the Order of Australia, and as a Knight of Grace of the Order of St John. In spite of his many academic achievements and awards in various fields of medicine, Peter was self-effacing and very generous in sharing his knowledge and supporting colleagues in their endeavours.

Our last personal contact with Peter was in May 2023 at the ISTM conference in Basel, where he completed his presidential term. Subsequently, we received his annual 'Christmas in July' letter that described the excitement of completing and furnishing his retirement home in Thailand to which he was looking forward to moving with Urepon, and his trip of a lifetime to Quito and Galapagos, Ecuador, for a Scientific Programme Committee. In addition, we were negotiating with Peter to write a guidance note on occupational dengue for *Occupational Health Southern Africa* as an expert in the field and an active member of the Scientific Committee: Biohazards and Occupational Health for the International Commission on Occupational Health.

Following his retirement, Peter was apparently intending to research into why people died while travelling: as a colleague of his said, *"an irony as he became the first statistic"*.

Our sincere condolences go to his wife, Urepon (Pan), and father, Bruce, as well as global friends and colleagues in travel medicine, tropical medicine, public health, and occupational medicine. Thank you for the opportunity to attend the very moving funeral service from afar, online. We shall remember Peter for his unwavering encouragement, guidance and friendship over the last 25 years, and cherish the many wonderful memories.

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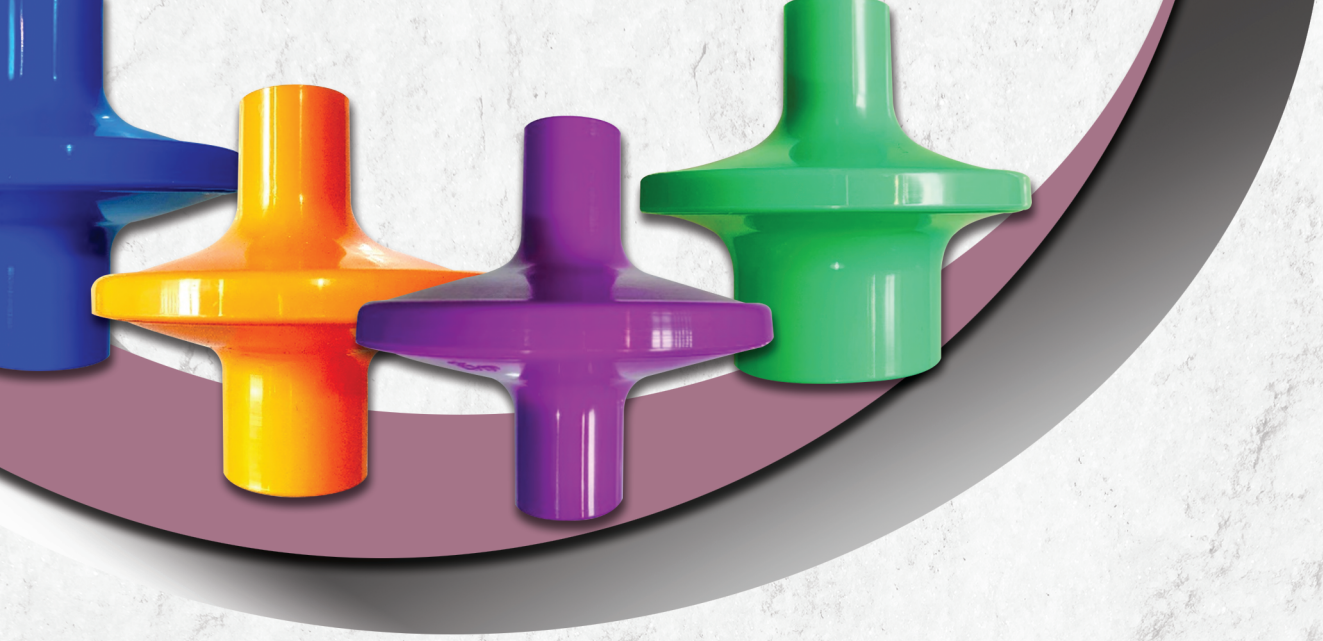
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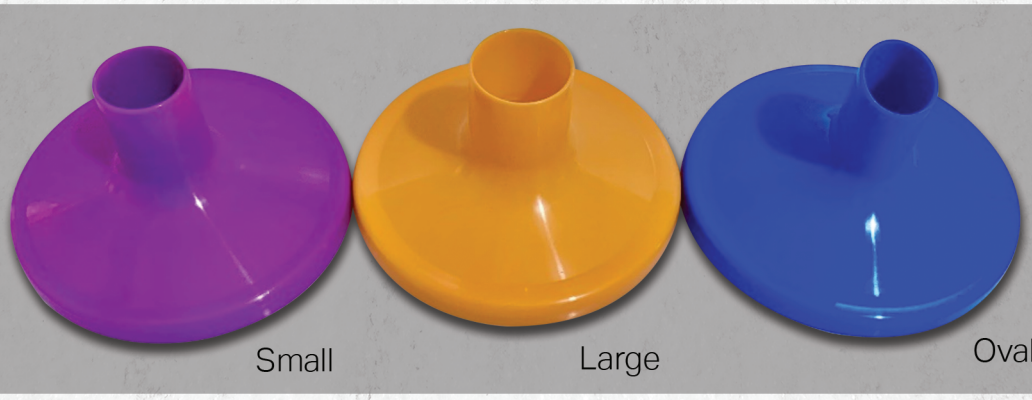
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	MSG	Short Adaptor
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IOSH opens call for research proposals

The Institution of Occupational Safety and Health (IOSH) is inviting proposals for research that focus on some of the key areas facing the profession.

IOSH is calling on researchers and academics to submit their proposals as it looks to enhance its understanding of upholding workplace health and safety standards around the world. The three areas it is looking for proposals on are:

- Investigations into work-related adverse health outcomes
- Occupational health training for occupational safety and health (OSH) professionals – context, challenges, and opportunities
- Algorithmic management and OSH risks in a digital workplace

Nicole Rinaldi, Director of Professional Services at IOSH, said: "*These three areas have been selected as they play a key part in the OSH profession and the world of work currently and can have a positive impact on workers' lives.*

"We are aiming to fund timely and original research which supports the move to establish a greater evidence base for health and safety policies and practice. This can then help us make significant strides towards achieving our vision of a safe and healthy world of work for all."

Investigations into work-related adverse health outcomes

With 12 billion working days lost globally every year to common mental health disorders, and work-related health problems causing an economic loss of 4–6% GDP for most countries, IOSH believes that this area is still under-investigated.

Various reasons have been cited for this lack of investigation, including lack of knowledge on how to investigate them, lack of training and understanding on the health effects of workplace exposures, and the latency of disease.

IOSH is seeking proposals from experienced researchers into the barriers and facilitators of such investigations. It is also looking to develop a framework, model, or guidance for use by multidisciplinary professionals.

Occupational health training for OSH professionals

According to the World Health Organization and International Labour Organization, work-related illness and disease is far more prevalent than workplace injuries.

IOSH is looking to receive proposals which explore occupational health knowledge among OSH practitioners, their required competence, and the role of OSH practitioners in preventing occupational disease in coming years.

They should explore aspects of occupational health training for OSH practitioners in countries with a sophisticated regulatory framework to evaluate:

- Knowledge of health impacts of occupational hazards
- Competencies required to prevent work-related diseases and ill health
- The role of education and training programmes in equipping the practitioner to address occupational disease

Algorithmic management and OSH risks in a digital workplace

Algorithmic management, also known as algorithmic control or digital management, refers to the utilisation of algorithms and automated systems to monitor, evaluate, influence, and discipline worker behaviour in various workplace settings.

This emerging phenomenon has gained significant attention in recent years as organisations increasingly rely on algorithms to streamline operations, improve productivity, and optimise decision-making processes. However, the implementation of algorithmic management systems also raises concerns regarding potential OSH risks in the workplace.

IOSH is seeking research that highlights the OSH impacts of cross-industry transference of digital technologies and organisations' adoption of algorithmic management.

Applications open

IOSH is accepting research proposals from Wednesday, 15 November until 23:59 (GMT) on Monday, 5 February 2024.

Drop-in sessions will be held online on 11 December for potential applicants to ask questions.

More information about submitting proposals can be found on the website at iosh.com/research23

Q(h)ubeka Trust update

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Allergic contact hand dermatitis due to constituents of nitrile gloves

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ABSTRACT

Purpose: This report of a case of allergic contact hand dermatitis due to constituents of nitrile gloves is to bring to the attention of practitioners four important practice points: 1) allergic contact dermatitis may occur due to exposure to chemicals in nitrile gloves; 2) skin patch testing is used to identify the causative allergens; 3) targeted allergens may be necessary in addition to the baseline European standard series if the standard series is unhelpful; and 4) there are potential interventions to manage nitrile glove dermatitis.

Findings: A laboratory analyst had occupational exposure to several allergens and had worn latex gloves. She was exposed to laboratory chemicals and powdered ore dust, containing precious metals. She developed hand dermatitis and was relocated to administrative duties not requiring glove use. Her dermatitis cleared but recurred when she returned to the laboratory and started using nitrile gloves. On history, nitrile gloves and platinum group metal ore dust were consistently associated with her hand dermatitis, but laboratory chemicals were not. Latex-specific immunoglobulin E (IgE) was negative, as were skin patch tests for 13 allergens in the metal series, including salts of platinum group metals. She had positive allergic reactions to cobalt chloride, formaldehyde, nickel sulphate, and quaternium 15 in the European standard series patch tests. She did not react to the rubber chemicals in the European standard series, including thiuram mix. The patient was then tested with the rubber additives series because of the glove-relatedness of her hand dermatitis. She had positive reactions to three thiuram compounds used as accelerators in rubber gloves. The patient went on vacation during which time her dermatitis improved. She was relocated to a position without glove use or ore contact and her dermatitis did not recur.

Conclusions: An analytic laboratory worker developed hand allergic contact dermatitis due to nitrile glove constituents. The diagnosis is supported by the improvement in her dermatitis after cessation of glove use, negative metal series patch tests, and positive patch tests to accelerators found in rubber gloves. Nevertheless, a contribution to the dermatitis by metals in the platinum group metal ore dust cannot be excluded.

Recommendations: Nitrile glove constituents should be considered in wearers who develop hand dermatitis. Skin patch testing is recommended to investigate putative agents. Specific patch test series for more targeted testing may be required.

INTRODUCTION

Nitrile, also called nitrile butadiene, is a synthetic rubber produced from a copolymer of acrylonitrile and butadiene.[1] Nitrile gloves contain this rubber but also other constituents such as accelerators. Accelerators are chemicals used to speed up the process of vulcanisation – chemical crosslinking to give rubber its useful characteristics, such as strength and retraction to its original shape after stretching – at a lower temperature and with greater efficiency. Commonly used classes of accelerators in rubber gloves are thiurams, dithiocarbamates, thiazoles, guanidines, and thiourea. Each class contains several individual chemicals.[2,3]

Nitrile gloves have replaced latex gloves in many workplaces because of latex allergy concerns.[4] Hand protection is required in many occupations; consequently, nitrile glove use is widespread, as shown in Box 1.

Given the multiple uses of these gloves, the global market is large, estimated at US$ 6.55 billion in 2022.[5] We could not find data on the number of people using nitrile gloves in South Africa or southern Africa, but it is reasonable to expect that it is many thousands due to the size of the workforces in the occupations listed in Box 1.

Despite the preference for nitrile gloves in some settings, they have also been shown to cause allergic contact dermatitis (ACD) [2,3] through a type IV cell-mediated immune response. Hypersensitivity due to the actual nitrile rubber in gloves is rare,[6] but the accelerators used in regular nitrile gloves are common causes of sensitisation. [2,3]

Box 1. Some occupations in which nitrile gloves are used

- Automotive workers
- Cleaners
- Food handlers
- Gardeners
- Hair salon workers (stylists, washers, etc.)
- Healthcare workers (doctors, nurses, dentists, phlebotomists, students, etc.)
- Housekeepers
- Laboratory workers (technicians, technologists, scientists)
- Tattoo artists
- Veterinary care workers

Skin patch tests are used to identify compounds causing ACD. Patch testing involves the application against the skin – usually on the upper back – of suspect allergens in chambers held against the skin by hypoallergenic tape (Figure 1). An occlusion time (contact with the skin) of two days is recommended before removing the chambers.[7] Reading the skin reactions to identify allergic responses is done some days after initial application; the exact number varies but the European Society of Contact Dermatitis recommends readings at day 2 (i.e. after removal of patches), day 3, or day 4, and when indicated around day 7.[7] Reading on day 7 is only necessary for some allergens, e.g. corticosteroids and aminoglycoside antibiotics, and when earlier readings are negative. There are standard commercially available series of compounds that are used in patch testing.

The European standard series (ESS) is the most used baseline series and covers more than 30 common skin allergens or groups of allergens, including group mixes of rubber accelerators. There are specific series available commercially for more targeted testing based on the patient's exposure. The rubber additives series made by Chemotechnique Diagnostics is an example. This series includes 27 different allergens, including accelerators, stabilisers, antioxidants, and preservatives (biocides). It is recommended that the individual rubber additives be tested if glove allergy is suspected, in addition to the baseline series, to avoid false negative reactions. In addition, patch testing using the patients' own protective gloves may be required – pieces of the protective glove are moistened with water, applied under a tape, and left on for a week.[2]

We report a case of allergic hand dermatitis due to accelerators in nitrile gloves. The purpose of this report is to bring to the attention of practitioners four important practice points:

1. ACD may occur due to exposure to chemicals in nitrile gloves;
2. Skin patch testing is used to identify one or more of the causative allergens;
3. There is a need to use more targeted allergens in addition to the ESS if the patch test results with the latter are unhelpful; and
4. Potential interventions to manage glove-induced allergy include use of accelerator-free or low allergenic accelerator gloves.

The patient gave written consent for the use of her clinical information and pictures shown in this report. Ethical approval was obtained from the Human Research Ethics Committee (Medical), University of the Witwatersrand (clearance certificate no. M2211128).

CASE DESCRIPTION

The patient was a 38-year-old female laboratory analyst evaluated at the National Institute for Occupational Health (NIOH) Dermatology Clinic in Johannesburg in 2022. She had a strong family history of atopic disease. Occupational laboratory exposures reported by the patient were mainly fine dust from platinum group metal (PGM) ore, acetone, borax, hydrogen peroxide, and several acids. She changed her nitrile gloves three to four times a shift and was careful to avoid contaminating her hands with dust or chemicals during glove changes.

Her main complaint was hand dermatitis that started in 2014. At that time, she was working as an analyst in laboratories and wore latex gloves. There was no record of a positive test of latex sensitisation and the diagnosis is thus uncertain. She was relocated to mostly administrative work, partly due to suspected latex allergy. During her absence from the laboratories, she did not wear gloves or work with laboratory materials. Her dermatitis cleared and she stopped treatment. In 2021 she returned to laboratory work and wore nitrile gloves and worked with PGM ore dust. Her hand dermatitis recurred in September 2021 (Figure 2) and treatment, including oral prednisone, was reinitiated.

RESULTS

Skin prick tests and latex IgE

Skin prick tests (SPTs) were done at the NIOH with 10 common aeroallergens. The patient had positive reactions (≥ 3 mm larger than the negative control) to house dust mite, cockroach group mix, Bermuda grass, and London plane tree – findings consistent with atopy. She had negative SPTs to nickel chloride and sodium hexachloroplatinate. Latex-specific IgE was negative at 0.00 kU/L. Latex sensitisation was not pursued as the patient did not wear latex gloves or report symptoms associated with latex.

Skin patch tests

Skin patch test chambers were prepared by the NIOH Immunology and Microbiology Section from commercial patch tests series allergens (Chemotechnique MB Diagnostics, Sweden). Skin patch tests were negative for 13 allergens in the metal series, including salts of five PGMs, viz. iridium, palladium, platinum, rhodium, and ruthenium. The patient had positive allergic reactions to cobalt chloride, formaldehyde, nickel sulphate, and quaternium 15 in the ESS, but negative reactions to the rubber chemicals, including thiuram mix (Figure 3).

Because the patient reported a strong association between glove wearing and her dermatitis, a decision was made also to test her reactions to the specific rubber additives series. She had 1+ positive allergic reactions to tetramethylthiuram disulphide, tetramethylthiuram monosulphide, and tetraethylthiuram disulphide, and 2+ positive allergic reactions to methenamine (hexamethylenetetramine) (Figure 4).

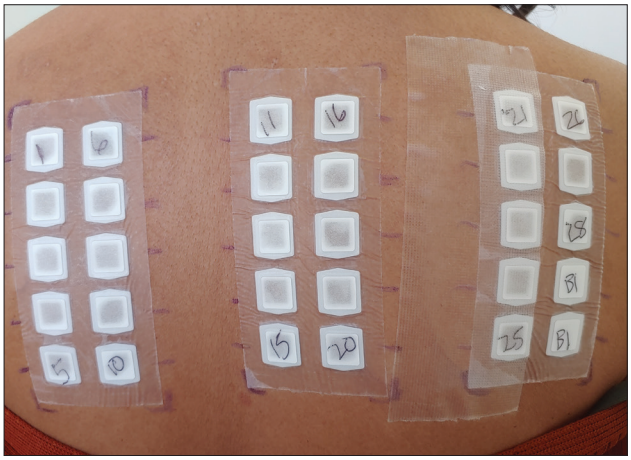


Figure 1. Skin patch tests on the patient's back
Photograph: Anna Fourie



Figure 2. Hand dermatitis during use of nitrile gloves
Photograph: courtesy of patient

NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH
Division of the National Health Laboratory Service

Patients Name: FM Lab No: IM00100 Date: 15/7/22.

Test done by: ISM Signature: _____

No	European Standard Series	Conc (%)	Results 1 Date: 18/7/22	Results 2 Date: 19/07/22
1	Potassium dichromate	0.5	—	—
2	Neomycin sulphate	20.0	—	—
3	Thiuram mix	1.0	—	—
4	p-Paraphenylene diamine (PPD)	1.0	—	—
5	Cobalt (II) chloride hexahydrate	1.0	1+	1+
6	Caine mix III	10.0	—	—
7	Formaldehyde (aq)	2.0	2+	3+
8	Colophonium	20.0	—	—
9	Propolis	10.0	—	—
10	Balsam of Peru (Myroxylon Pereirae resin)	25.0	—	—
11	N-Isopropyl-N-phenyl-4-phenylenediamine (IPPD)	0.1	—	—
12	Lanolin alcohol (Wool alcohol)	30.0	—	—
13	Mercapto mix	2.0	—	—
14	Epoxy resin – Bisphenol A	1.0	—	—
15	Paraben mix	16.0	—	—
16	4-tert-butyl phenolformaldehyde resin (PTBP)	1.0	—	—
17	Fragrance mix	8.0	—	—
18	Quaternium 15 (Dowicil 200)	1.0	1+	2+
19	Nickel (II) sulphate, $6H_20$	5.0	1+	1+
20	Methylisothiazolinone + methylchloroisothiazolinone	0.02 Aq	—	—
21	Mercaptobenzothiazole (MBT)	2.0	—	—
22	Sesquiterpene lactone mix	0.1	—	—
23	Budesonide	0.01	—	—
24	Tixocortol-21-pivalate	0.1	—	—
25	Methyldibromo glutaronitrile	0.5	—	—
26	Fragrance mix II	14.0	—	—

No	European Standard Series	Conc (%)	Results 1 Date: 18/7/22	Results 2 Date: 19/07/22
27	Lyral (Hydroxyisohexyl 3-cyclohexene carboxaldehyde)	5.0	—	—
28	Methylisothiazolinone	0.2Aq	—	—
29	Textile Dye mix	6.6	—	—
30	2-Hydroxyethyl methacrylate	2.0	—	—
31	Petrolatum	100	NT	NT

Read by: ISM ISM

NT – NOT TESTED

Figure 3. Patient responses to the European standard series skin patch tests 2022

NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH
Division of the National Health Laboratory Service

Patients Name: FM Lab No IM00100 Date: 6/9/22

Test done by: ISM Signature: _____

No	Rubber Series	Conc (%)	Results 1 Date: 9/9/22 AM	Results 2 Date: 9/9/22 PM
1	Tetramethylthiuram disulfide (TMTD)	1.0 pet	1+	1+
2	Tetramethylthiuram monosulfide (TMTM)	1.0 pet	1+	1+
3	Tetraethylthiuram disulfide (TETD)	1.0 pet	1+	1+
4	Dipentamethylenethiuram disulfide	1.0 pet	—	—
5	N-Cyclohexyl-N-phenyl-4-phenylenediamine	1.0 pet	—	—
6	N,N-Diphenylpphenylenediamine (DPPD)	1.0 pet	—	—
7	N-Isopropyl-N-phenyl-4-phenylenediamine (IPPD)	0.1 pet	—	—
8	2-Mercaptobenzothiazole (MBT)	2.0 pet	—	—
9	N-Cyclohexyl-2-benzothiazolesulfenamide	1.0 pet	—	—
10	Dibenzothiazyl disulfide (MBTS)	1.0 pet	—	—
11	2-(4-Morpholinylmercapto)benzothiazol (MOR)	1.0 pet	—	—
12	1,3-Diphenylguanidine	1.0 pet	—	—
13	Zinc diethyldithiocarbamate (ZDC)	1.0 pet	—	—
14	Zinc Dibutyldithiocarbamate (ZBC)	1.0 pet	—	—
15	N,N-Di-2-naphtyl-4-phenylenediamine (DBNPD)	1.0 pet	—	—
16	N- Phenyl-2-naphtylamine (PBN)	1.0 pet	—	—
17	Methenamine (Hexamethylenetetramine)	2.0 pet	2+	2+
18	4,4-Diaminodiphenylmethane (MDA)	0.5 pet	—	
19	N,N-Diphenylthiourea (DPTU)	1.0 pet	—	—
20	Zinc dimethyldithiocarbamate (Ziram)	1.0 pet	—	—
21	2,2,4-Trimethyl-1,2-dihydroquinoline	1.0pet	—	—
22	N,N-Diethylthiourea	1.0 pet	—	—
23	N,N-Dibutylthiourea	1.0 pet	—	—
24	Dodecyl mercaptan	0.1 pet	—	—
25	N-(Cyclohexylthio) phthalimide	1.0 pet	—	—
26	Thiourea	0.1 pet	—	—
27	4,4 Dithiodimorpholine	1.0 pet	—	—
28	Petrolatum	100	—	—

Read by: ISM ISM.

Figure 4. Patient responses to the rubber additives series skin patch tests 2022

All these compounds are accelerators used in the manufacture of rubber gloves and have been reported to cause dermatitis in sensitised people.[2]

Clinical course and management

During investigation, the patient continued doing laboratory work, had flare-ups of dermatitis, and required ongoing treatment. The negative tests of sensitisation to PGM salts (both skin prick and skin patch tests), together with the temporal association of dermatitis with glove use and positive patch tests to constituents of rubber gloves, led to a diagnosis of nitrile glove dermatitis.

Soon after diagnosis the patient stopped working for about two months, during which time her rash improved substantially (Figure 5). She returned to work but to tasks that did not require glove use. As of mid-2023, she was clear of dermatitis.

DISCUSSION

We diagnosed a case of nitrile glove-related ACD in a laboratory analyst based on a history of glove-related hand rash, clinical features of dermatitis, positive allergic skin patch tests to rubber accelerators with negative tests to alternative occupational exposures, including PGM, and improvement of rash on cessation of glove use.

The patient had a family history of atopy and skin prick tests were positive for aeroallergens. Atopy is known to be a strong predisposing factor for the development of ACD.[8]

Glove-related ACD is well documented,[2,3,9,10] and South Africa is no exception to its occurrence.[11] The most common cause in synthetic rubber glove users – including those who use nitrile gloves[2] – is exposure to accelerators; thiurams have been the most common culprits, followed by dithiocarbamates.[9] This pattern has changed in some regions, however, as thiuram use has been reduced or substituted by certain glove manufacturers. The most common sensitiser in healthcare workers using synthetic rubber gloves in Brussels in 2010–2017 was 1,3-diphenylguanidine.[10]

Notably, the patient had positive skin patch test reactions to three of four thiuram allergens in the rubber additives series, but was negative to the thiuram mix in the ESS, which combined into one patch test: tetramethylthiuram disulfide, tetramethylthiuram monosulfide, tetraethylthiuram disulfide, and dipentamethylenethiuram disulfide. Sensitisation to thiurams would have been missed had only the ESS been used. Under-detection of thiuram sensitisation (false negatives) by the thiuram mix, compared to individual thiurams, has been reported; 17% false-negative reactions were reported in one case series.[12] In a French multi-centre study, almost 45% of the sensitisations to glove allergens were detected only by a rubber series.[13] Testing with a dedicated rubber series, using individual thiurams – preferably at 1% in petroleum jelly – is recommended in patients with suspected contact allergies to rubber, to avoid false-negative results.[12,13,14,15]

A possible explanation for the contradictory patch test results is the low concentration of thiurams in the mix – 0.25% for each of the four (Figure 3) versus 1% for each of the individual thiuram allergens in the rubber additives series (Figure 4).

Considerations

Distinguishing between allergic and irritant skin patch test reactions can be difficult. In the case reported here, an experienced scientist interpreted the patch test reactions and identified typical allergic reactions (Figure 6).

The patient had positive allergic skin patch test reactions to formaldehyde in the ESS and quaternium 15, and to the metal salts, cobalt chloride, and nickel sulphate. Formaldehyde and the formaldehyde releasing quaternium 15 are commonly used preservatives in many household products and cosmetics. They are regarded as problematic patch test substances with poor reproducibility, and a cause of irritant reactions.[16] The patient was not exposed to these substances at work and recovered when away from work and not wearing gloves. The PGM ore dust might have contained nickel as the metal has been found in platinum refinery dust,[17] and South African PGM ores may also contain cobalt.[18] Nickel and cobalt are commonly found in electroplated items such as jewelry, zips, coins, and metal buttons and their contribution to her ACD cannot be excluded. However, her sensitisation to thiurams, hand dermatitis, and frequent use of nitrile gloves strongly support the diagnosis of glove dermatitis.

Potential interventions

Besides job relocation or re-allocation of tasks that require gloves, substitution of nitrile gloves with those that do not contain rubber components and are accelerator-free or have low allergenic accelerators may be successful. There are several options.[2,19] The choice is partly informed by work requirements (e.g. tactility), and the need for protection against chemicals or microbes.[2] Numerous guides exist to inform protective glove selection, including that of the US Occupational Safety and Health Administration.[20] Kersch et al. (2018) provide some recommendations for glove selection.[3] Increased cost and limited availability may, however, be hindrances to the use of gloves that are accelerator-free or contain low allergenic accelerators. Non-nitrile synthetic rubber gloves, e.g. polyisoprene and polychloroprene (neoprene), may contain high concentrations of accelerators, and cause hand dermatitis.[10] Replacing nitrile gloves with other synthetic rubber gloves may, therefore, be unhelpful if those gloves contain allergenic accelerators. Gloves without accelerators have been shown to reduce or eliminate allergic reactions.[10] A possible solution, if suitable accelerator-free protective gloves are not obtainable, is to use polyethylene gloves as liners underneath the accelerator-containing protective gloves.[2]

CONCLUSION

Testing with a dedicated rubber series with individual additives at a suitable concentration (typically 1% petroleum jelly), is recommended for patients with suspected contact allergies to rubber to avoid false-negative results.[12,14]



Figure 5. Improved hand dermatitis while away from work
Photograph: courtesy of patient



Figure 6. Positive skin patch test reactions to ESS 2022
Photograph: Anna Fourie

KEY MESSAGES

1. ACD occurs due to exposure to chemicals in nitrile gloves.
2. Skin patch testing is necessary for the identification of the causative allergen.
3. Targeted allergens are needed in addition to the ESS in patients with features consistent with ACD but with unhelpful ESS test results.
4. There are interventions that can potentially manage nitrile glove-related ACD.

DECLARATION

The authors declare that this is their own work; all the sources used in this paper have been duly acknowledged and there are no conflicts of interest. The investigation of the patient was conducted at the National Institute for Occupational Health without commercial gain.

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AUTHOR CONTRIBUTIONS

Data acquisition: AF, HAC, NN
Interpretation of the data: DR, AF, HAC, NN
Drafting of the paper: DR
Critical revision of the paper: DR, AF, HAC, NN

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HIV in the Eastern Cape province of South Africa threatens farm employment and food security

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ABSTRACT

Introduction: Human immunodeficiency virus' (HIV's) threat to food security is highest in areas with high poverty levels. The OR Tambo district in the Eastern Cape province has the highest poverty rate in South Africa (80.4%); HIV prevalence is 11.4%.

Objective: The purpose of the study was to describe the threat that HIV poses to farm employment and food security in the Eastern Cape province of South Africa.

Methods: A multi-method approach was used. The quantitative component was a cross-sectional design and the qualitative component was a narrative design. The study population comprised approximately 7 000 smallholder farmers from the five local municipalities in the OR Tambo district. Participants for both the qualitative and quantitative aspects of the study were selected using convenience sampling. Quantitative data were collected using questionnaires and qualitative data were collected from face-to-face interviews. Quantitative data were analysed using descriptive statistics and the chi-square test. Qualitative data were analysed using Tesch's eight-step procedure for thematic content analysis.

Results: Five hundred and ninety-three farmers completed the questionnaire. Most agreed that HIV affects food security (n = 486, 72.0%), that HIV negatively affects food security (n = 454, 76.6%), that people living with HIV are excluded from farming activities (n = 426, 71.8%), and that HIV affects farming skills (n = 495, 83.5%). A significantly larger proportion of farmworkers older than 60 years than those who were younger perceived the threat to food security. Twenty participants described the effect of HIV on farm workers in interviews, and highlighted that HIV impacts farm skills and labour due to ill health and lost income from farming, which threatens food security.

Conclusion: HIV threatens food security among smallholder farmers in the OR Tambo district due to farmworkers' diminished capacity to work and consequent reduced income, which affects their ability to secure food.

INTRODUCTION

Human immunodeficiency virus (HIV) and acquired immunodeficiency disease (AIDS) mostly affect people in their productive ages.[1] People living with AIDS (PLWA) develop debilitating infections and/or cancers, which affect economic productivity, including farming.[1] Farming, including planting and harvesting, is labour intensive and requires high levels of physical fitness.[2] In the OR Tambo district in the Eastern Cape province of South Africa, farming is the main land use and provides employment and food security.[3] HIV poses a threat to both as PLWA are unable to continue farming activities that secure the supply of food.[4]

In the South African agriculture industry, workers are employed on either mechanised, well-resourced, large commercial farms, which produce around 95% of all food on 87% of agricultural land,[5,6] or smallholder farms, which occupy 13% of the land and where livestock is the main source of income.[5] These smallholder farmers also cultivate maize, cabbages, potatoes, and other crops, which provide a secondary source of income of approximately R26 000 annually.[5] A larger proportion of workers is employed on smallholder farms than on commercial farms; the estimated four million farmers are becoming increasingly diverse in terms of income and capacity to produce.[6,7] Poverty and poor farm performance have been identified as causes of food insecurity, especially for poorer smallholder farmers.[7]

Food security is defined as access to food (physically and economically) all the time.[8] Researchers have noted that HIV impacts food security through related mortality, morbidity, and the care burden on family members.[9-11] In a study conducted in Nigeria, it was reported that PLWH who are involved in agricultural activities spend 11.4–16.6 hours on agricultural activities, compared to 33.6 hours spent by those without HIV.[9]

The threat to food security by HIV is exacerbated in countries with high HIV prevalences and high levels of poverty, and in areas where there is poor agricultural management.[12] The threat posed by HIV to farm employment and food security does not only impact PLWH. In the study conducted in Nigeria (Ater et al., 2018), the average number of people involved in agricultural production was three in families with PLWH compared to four in families without PLWH.[9] A study in Nepal reported that HIV infection reduces productivity by at least 5.05 days per month.[1] Furthermore, food security is affected by a decline in agricultural skills due to HIV-related mortality, incapacity due to illness, and/or time lost in imparting skills due to care demands.[13]

The OR Tambo district is one of seven district municipalities in the Eastern Cape province of South Africa. It is predominantly rural (93%) and the major land use is agriculture, including subsistence farming (smallholder farms).[14] The HIV prevalence in the district is estimated at 11.1% and it is ranked the poorest in South Africa; 80.4% of people were estimated to be living in poverty in 2020,[14]

defined as a lack of financial and material resources among people or communities. The World Bank measures this by the number of people living on less than US$1.90 per day.[7,14]

The social ecological model (SEM) underpins this study and takes a critical perspective of the interaction of HIV infection and food security that recognises four levels of health determinants.[15] At the individual level, health, age, and socio-economic status determine the level of food security. At the relationship level, food security is determined by family characteristics such as number of dependents. At the community level, rules and regulations that govern farm work or access to healthcare facilitate or inhibit access to treatment, affecting productivity and food security. The fourth level is societal and includes public policy, which ensures synergies of institutions such as clinics and commercial farms.

The high poverty rate in the OR Tambo district, where HIV is the leading cause of death and agriculture is the main land use, rationalised the need to conduct the study in this district. The purpose of the study was to describe farm workers' perceptions about the threat of HIV to farm employment and food security. Understanding the perceptions of the farm workers regarding these issues addressed a research gap outside the healthcare system.

METHODS

The study was conducted amongst rural smallholder farm workers in the five local municipalities of the OR Tambo district, viz. Port St. Johns, King Sabatha Dalindyebo, Mhlontlo, Nyandeni, and Ingquza Hill, using a multi-method approach. Data were collected in April and May 2022.

Quantitative aspect

A cross-sectional study design was used. The study population was all farm workers in the five local municipalities (approximately 7 000).[14] Convenience sampling was used to select the participants, based primarily on distance that needed to be travelled to locate the potential participants. A sample size of 710 was calculated, using sampling tables described by Orban (2021),[16] based on 95% confidence and a 3.5% margin of error.[16]

Quantitative data were collected using a questionnaire administered in English and IsiXhosa. The first section comprised five questions, regarding socio-demographic data (age, sex, marital status, ethnicity, and level of education). The second section contained four questions about HIV and food security.

A pilot study was conducted in March 2022 to test the feasibility of the study. The pilot study comprised 30 respondents, who were not included in the main study.

Data analysis

Descriptive analysis was conducted, using the Statistical Package for Social Sciences (SPSS) version 0.26 and Microsoft Excel. The chi-square test was used to test for associations between the demographic variables and perceptions. Significance was determined at $p \leq 0.05$.

Qualitative aspect

The qualitative aspect of the study took a narrative approach. Farm workers who did not participate in the quantitative aspect of the study were selected, using convenience sampling. In-depth interviews were conducted with the aid of a semi-structured interview guide, in IsiXhosa and English; all were audio recorded. Data collection stopped once data saturation was reached.

Data analysis

Tesch's eight-step procedure for thematic analysis was used to analyse the qualitative data after transcribing and translating the recorded data.[17] Trustworthiness was ensured by using Lincoln and Guba's (2005) framework.[18] Credibility was ensured by the participants confirming the findings of the study, and using peer researchers who checked that the findings did not reflect the views of the researchers. Dependability was ensured by triangulating study findings with those from the quantitative aspect of the study. Confirmability was ensured by checking and rechecking data throughout the data analysis process. Transferability was ensured by describing the study setting and procedures used in conducting the study in the OR Tambo district.

Ethical considerations

Ethical clearance for the study was granted by the University of South Africa College of Human Sciences Research Ethics Review Committee (reference number 90269543_CREC_CHS_2021). Permission to conduct the study was also granted by the Department of Rural Development and Agriculture and individual farms where the study was located.

RESULTS

Socio-demographic characteristics

A total of 593 of the 710 participants who were sampled completed the questionnaire (83.5% response rate).

The ages of the respondents ranged from 18 to 88 years. The proportion of males and females was similar (Table 1). Most participants were single (n = 323, 54.5%) and most were black African (n = 555, 93.9%). The majority of the respondents (n = 297, 50.1%) had a secondary education.

As shown in Table 2, the majority of the respondents agreed that HIV may affect food security(n = 486, 72.0%) and that HIV has a negative impact on food security (n = 454, 76.6%). Most respondents (n = 426, 71.8%) agreed that PLWH are excluded from farming activities, and most (n = 495, 83.5%) agreed that scarce skills experience is diminishing farming communities due to HIV and AIDS (Table 3).

Most respondents in all age groups agreed with the statements that HIV is a threat to food security. A slightly greater proportion of participants older than 60 years agreed that HIV is a threat to food security than those in younger age groups for all statements other than *"people living with HIV are excluded from farming activities"* (Table 4).

A greater proportion of males than females agreed with all four statements. For example, 248 (51.8%) men agreed that PLWH are excluded from farming activities, compared to 178 (45.9%) females. The differences were small and ranged from 0.4% to 6%.

Twenty farm workers participated in the qualitative interviews and were aged 25 to 61 years (mean 41.4 years, SD ± 12.5). Twelve were male and eight were female.

Participants noted how HIV affected labour due to ill health and consequent loss of employment. They also explained how loss of income from livestock resulted in food insecurity, and how skills in farming were lost due to ill health, which diminished the capacity to produce food and income for food security. Three main themes emerged.

Theme 1. HIV impacts farming skills

The first theme was 'HIV impacts farming skills', which came from shared experiences about how scarce skills and experiences in the farming community are diminishing due to HIV and AIDS.

Participants explained how AIDS-related deaths resulted in loss of farm workers and farming skills. This loss of skills also affected children of farm workers who died without imparting their skills.

"Due to deaths in families, there is less or no parent-to-child transmission of agricultural and livestock knowledge and skills." (participant 6)

"There will be less workers left if most people fail to manage their positive status, those who are skilled for the development of farming will be less likely to work if they do not take HIV medication to manage the disease." (participant 10)

Theme 2. HIV impacts labour, which decreases food production

The second theme was 'HIV impacts labour, resulting in decreased food production' and was elicited from the discussion on the effect of HIV on food production. Participants described how farm sizes were diminishing because of reduced labour.

"There will be a decline in harvests because of labour and input shortages, people are sick from HIV related illnesses, farms are slowly diminishing in OR Tambo district." (participant 3)

They also described that this was a consequence of taking time off from work, which resulted in reduced earnings that affected food security. One participant described how labour on farms was affected by death due to HIV, which resulted in reduced working times as people attended funerals.

"Since there are so many deaths of our loved ones, there is less of productive time because we must attend funerals and grieve or mourn for them. The mourning usually takes months without going to work." (participant 15)

Table 1. Socio-demographic characteristics of study participants (N = 593)

Characteristic	Value	n	%
Age (years)	< 30	249	42.0
	31–40	104	17.5
	41–50	115	19.4
	51–60	47	7.9
	> 60	78	13.2
Sex	Male	303	51.1
	Female	290	48.9
Marital status	Married	213	35.9
	Single	323	54.5
	Divorced	44	7.4
	Unmarried, cohabiting	13	2.2
Ethnicity	Black African	555	93.9
	Caucasian	11	0.2
	Indian	18	0.3
	Coloured	34	5.7
Education	None	36	6.0
	Primary	141	23.8
	Secondary	297	50.1
	Tertiary	119	20.1

Table 2. Perceptions about the threat of HIV to food security (N = 593)

Statement	Response*	n	%
HIV and AIDS may affect food security	Agree	486	72.0
	Disagree	107	18.0
People living with HIV are excluded from farming activities	Agree	426	71.8
	Disagree	167	28.2
HIV and AIDS have a negative impact on food security	Agree	454	76.6
	Disagree	139	23.4
Skills and experience in farming communities are diminishing due to HIV and AIDS	Agree	495	83.5
	Disagree	98	16.5

*'Agree' includes 'strongly agree', 'disagree' includes 'strongly disagree'

Table 3. Perceptions of HIV and food security among farm workers, by age group (N = 593)

Statement	Age group (years)	Agree*		Disagree*		Total	p value
		n	%	n	%		
HIV and AIDS may affect food production	< 30	169	67.9	80	32.1	249	0.0020
	31–40	96	92.3	8	7.7	104	
	41–50	103	89.6	12	10.4	115	
	51–60	46	97.9	1	2.1	47	
	> 60	77	98.7	1	1.3	78	
People living with HIV and AIDS are excluded from farming activities	< 30	135	54.2	114	45.8	249	< 0.0001
	31–40	80	76.9	24	23.1	104	
	41–50	90	78.3	25	21.7	115	
	51–60	47	100.0	0	0.0	47	
	> 60	74	94.9	4	5.1	78	
HIV and AIDS have a negative impact on food security	< 30	152	61.0	97	39.0	249	< 0.0001
	31–40	83	79.8	21	20.2	104	
	41–50	100	87.0	15	13.0	115	
	51–60	44	93.6	3	6.4	47	
	> 60	75	96.2	3	3.8	78	
Skills and experience in farming communities are diminishing due to HIV and AIDS	< 30	191	76.7	58	23.3	249	0.0300
	31–40	87	83.7	17	16.3	104	
	41–50	100	87.0	15	13.0	115	
	51–60	41	87.2	6	12.8	47	
	> 60	76	97.4	2	2.6	78	

*'Agree' includes 'strongly agree', 'disagree' includes 'strongly disagree'

Table 4. Perceptions of HIV and food security among farm workers, by sex (N = 593)

Statement	Sex	Agree*		Disagree*		Total	p value
		n	%	n	%		
HIV and AIDS may affect food production	Male	266	87.8	37	12.2	303	0.0020
	Female	220	75.9	70	24.1	290	
People living with HIV and AIDS are excluded	Male	248	81.8	55	18.2	303	< 0.0001
from farming activities	Female	178	61.4	112	38.6	290	
HIV and AIDS have a negative impact on	Male	255	84.2	48	15.4	303	< 0.0001
food security	Female	199	68.6	91	31.4	290	
Skills and experience in farming communities	Male	272	89.8	31	10.2	303	< 0.0010
are diminishing due to HIV and AIDS	Female	223	76.9	67	23.1	290	

*'Agree' includes 'strongly agree', 'disagree' includes 'strongly disagree'

Sub-theme 2.1 Loss of employment due to ill health

A sub-theme that supported the theme 'HIV impacts labour' was loss of employment due to ill health. Participants explained how farm workers with HIV take time off due to illness, and how such absenteeism results in dismissal. Thus, ill health reduces the time spent at work, which affects income and food security.

> *"If the virus becomes uncontrollable, people could lose jobs because of frequent illnesses and having to take time off from work."* (participant 5)

> *"People who are working in the farm could lose their jobs because of being ill all the time. Farm bosses do not tolerate being absent from work all the time."* (participant 8)

Theme 3. Reduction in income from farming threatens food security

The third theme was 'reduction in income from farming threatens food security', which emerged in response to the question about the impact of HIV and AIDS on food security. Participants shared their experiences of selling livestock – their source of income and food – to meet healthcare and funeral costs due to HIV. They also explained that income from looking after the livestock was depleted as people living with HIV did not have the capacity to do this. This affected food security among PLWH.

> *"Those who own farming livestock, they are now selling their livestock and other assets for health treatment and burial of their loved ones."* (participant 5)

> *"There is a drop in capacity of men, women, boys and girls to manage livestock resources because they cannot afford to, we need more money for stock farming."* (participant 11)

DISCUSSION

We sought to describe perceptions amongst farmworkers in the OR Tambo district of the Eastern Cape province about the threat of HIV to farm employment and food security. The majority of respondents agreed that HIV threatens food security. This perception was supported by the findings from the qualitative interviews where participants concurred, and explained that this threat to food security emanates from a decline in the food produced due to time taken off because of ill health.

Ater et al. (2018), in a study in Nigeria, reported that HIV results in less time allocated to farming activities, resulting in decreased agricultural production.[9] Ill health due to HIV affects the nature of farming as an occupation. Malanski, et al. (2019), after conducting a study in France, noted that farming activities are labour intensive and physically demanding in the absence of mechanisation among small-scale subsistence farmers.[2] Farm workers in our study highlighted how ill health affected labour, resulting in decreased food production. Consequentially, HIV affects the common economic activity in the OR Tambo district, namely farming.[3]

Most of the study participants agreed that PLWH are excluded from farming activities. Those who were interviewed described how constant ill health resulted in dismissal from work. A study conducted in Nepal reached a similar conclusion, reporting that PLWH work for fewer hours on farms than those who are not infected, as they seek treatment or cannot work due to ill health.[1]

Most of the study participants agreed that HIV has a negative impact on food security. This was supported by the participants who were interviewed; they explained that the negative impact of HIV on food security was also through the selling of livestock to meet the costs of funerals due to HIV-related deaths. This illustrates the cyclical impact of HIV on food security. Farming communities are forced to sell their livestock, which depletes both income and food. The USAID defines food security as physical or economic access to food all the time;[8] the disposal of livestock described by participants in this study threatens both physical and economic access to food.[8]

The majority of the respondents in the quantitative aspect of the study agreed that HIV resulted in loss of farming skills. Participants who were interviewed described how death and illness due to HIV left children and others without farming skills. These findings are similar to those from a study in Nigeria which concluded that HIV impacts on imparting agricultural skills due to illness or care demands.[10]

The SEM was used as the theoretical framework for the study. At the individual level, we found that the threat of HIV to employment was associated with potential dismissals due to ill health as farm workers sought healthcare. This threat to employment in turn threatens food security, which is dependent on income from farm employment. At the relationship level, the loss of skills within families due to HIV threatens food security. At the third level – the community – the exclusion of PLWH from farming activities results in food insecurity while, at the fourth (societal) level, the loss of income due to HIV threatens food security on a larger scale.

The sampling strategy (convenience sampling) is a limitation of the study. The findings may not be generalisable to all farm workers in the OR Tambo district.

CONCLUSION

Our findings show that farm workers perceive a threat to food security from HIV in the OR Tambo district, through loss of agricultural productivity as a result of exclusion of PLWH from farming activities due to illness and death, and loss of income and skills. Higher proportions of older than younger farm workers, and males than females, perceived the threat to food security. We recommend that further research be conducted to describe the impact of HIV on food security, beyond perceptions, among older and male farm workers. Understanding these differences in perceptions between men and women and among the different age groups enables equitable allocation of resources to mitigate the threat of HIV to farm employment and food security.

KEY MESSAGES

1. Farming communities in the OR Tambo district feel threatened by food insecurity as a result of HIV.
2. Threats to employment and food security are especially concerning in a poor community that sells livestock to mitigate the financial impact of HIV.
3. People living with HIV are excluded from farming due to ill health, which exacerbates food insecurity.

DECLARATION

The authors declare that this is their own work; all the sources used in this paper have been duly acknowledged and there are no conflicts of interest.

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AUTHOR CONTRIBUTIONS

Conception and design of the study: NLM, LNM, TRN
Data acquisition: LNM
Data analysis: NLM
Interpretation of the data: NLM
Drafting of the paper: LNM, NLM
Critical revision of the paper: TRN, NLM, LNM

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Health and safety incidents at a power utility in the Eastern Cape province of South Africa

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ABSTRACT

Background: Many high-risk and construction-related activities are performed in the course of distributing electricity throughout South Africa, including working at heights, driving, operating electrical networks, excavation work, and maintenance of electrical structures. South Africa has one power utility that provides electricity to the entire country. Different sectors of the utility are distributed throughout the nine provinces, with eight sectors in the Eastern Cape province.

Objective: We sought to compare health and safety incidents, and their causes, between the sectors in the Eastern Cape province.

Methods: Incident data from 2015 to 2019 were extracted from the power utility's Systems, Applications and Products in Data Processing of Environmental Health and Safety (SAP EH&S) database. The most common health and safety incidents and their reported causes are compared across sectors and described as counts and frequencies.

Results: There were 614 health and safety incidents recorded in the study period with motor vehicle accidents being the most common overall (n = 482, 78.5%). Incidents related to damage to equipment (n = 48, 7.8%), operating errors (n = 16, 2.8%), falls (n = 15, 2.4%), hand injuries (n = 13, 2.1%), and insect/animal bites (n = 13, 2.1%) were also recorded. Workers ignoring safety rules was the most common reported cause of these health and safety incidents (n = 449, 73.1%).

Conclusion: Motor vehicle accidents, damage to property, operating errors, falls, and hand injuries were frequently reported in the energy utility sectors in the Eastern Cape province. The most common recorded cause was workers ignoring health and safety rules. Training workers on the importance of reporting incidents, including near misses, can potentially reduce the frequency of health and safety incidents.

INTRODUCTION

Workplace health and safety plays a pivotal role in all industries. In South Africa, employers are mandated to identify hazards in the workplace and to determine corrective measures to prevent the occurrence of accidents and injuries.[1] In the national power utility, eight sectors constitute the maintenance and operations department in the Eastern Cape province. These sectors are mandated to repair and maintain the electrical distribution network. In all, safety rules, practices, and procedures are administrative controls for managing hazards. In compliance with legislative requirements, workers are made aware of their responsibilities to adhere to these rules and procedures.

Researchers have highlighted the interaction between humans, external factors, and unsafe work methods as factors that contribute to workplace health and safety incidents.[2] It is well documented that injuries and fatalities are due to health and safety incidents caused by human behaviour, including unsafe workplace practices, and unsafe use of machinery, equipment, and tools.

There is a strong relationship between the attitudes of workers and health and safety incidents.[3] Workers who fail to adhere to safety rules and procedures compromise workplace safety, while positivity, knowledge, behaviour, and adherence to a company's safety culture reduce the frequency of health and safety incidents.[4] Thus, a reduction in incidents can be achieved by encouraging positive safety behaviour amongst workers,[5] which includes open communication policies, the rapid reporting of incidents, and training programmes.[6]

Psycho-social factors to consider when analysing health and safety incidents include extended working hours, improper use of personal protective equipment (PPE), lack of training, ignorance, little or no experience, age, and lack of supervision and resources.[7] Extreme weather patterns also play a role.[8]

There is limited data regarding the types of health and safety incidents and their causes in power utilities. In this paper, we compare the different types and reported causes of health and safety incidents in the various sectors of a power utility in the Eastern Cape province of South Africa.

METHODS

This was a quantitative descriptive cross-sectional analysis of data from the power utility's Systems, Applications and Products in Data Processing of Environmental Health and Safety (SAP EH&S) database, for the period 2015 to 2019. The database is used to manage all health and safety incidents from the time of occurrence, through processing, to implementation of corrective measures, and is used by the health and safety officer to capture, store, and draw reports and information about health and safety incidents.

Health and safety incidents are reported to the supervisors by the workers as soon as possible. The supervisors notify the managers and the health and safety department immediately, and the incident is recorded on the SAP EH&S system within 48 hours after notification by the supervisor. South African legislation requires the employer to investigate a health and safety incident within seven days of occurrence,[9] to determine the causal factor of the incident and to establish corrective and preventative actions.

Table 1. Health and safety incident types, 2015–2019 (N = 614)

Type of incident	Sector																	
	Aliwal North		Butterworth		East London		Grahamstown		Lukhanji		Matatiele		Mthatha		Uitenhage		All	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Motor vehicle accident	62	83.8	39	70.9	39	63.9	26	65.0	126	82.9	59	79.7	96	86.5	35	74.5	482	78.5
Damage to equipment	4	5.4	8	14.5	3	4.9	3	7.5	13	8.6	10	13.5	2	1.8	5	10.6	48	7.8
Operating error	3	4.1	2	3.6	1	1.6	0	-	5	3.3	1	1.4	3	2.7	1	2.1	16	2.6
Falls	3	4.1	0	-	3	4.9	5	12.5	2	1.3	0		1	0.9	1	2.1	15	2.4
Hand injury	1	1.4	0	-	6	9.8	2	5.0	1	0.7	0	-	1	0.9	2	4.3	13	2.1
Insect/animal bite	0	-	1	1.8	5	8.2	2	5.0	1	0.7	1	1.4	3	2.7	0	0.0	13	2.1
Electrical contact	0	-	2	3.6	1	1.6	0	-	2	1.3	1	1.4	3	2.7	2	4.3	11	1.8
Eye injury	1	1.4	1	1.8	1	1.6	0	-	2	1.3	2	2.7	2	1.8	1	2.1	10	1.6
Back injury	0	-	1	1.8	0	-	1	2.5	0	-	0	-	0	-	0	-	2	0.3
Struck by moving object	0	-	1	1.8	1	1.6	1	2.5	0	-	0	-	0	-	0	-	3	0.5
Near miss	0	-	0	-	1	1.6	0	-	0	-	0	-	0	-	0	-	1	0.2
Total	**74**		**55**		**61**		**40**		**152**		**74**		**111**		**47**		**614**	

Data Analysis

The health and safety incidents were categorised as back injury, damage to equipment, electrical contact, eye injury, fall incident, hand injury, insect or animal bite, motor vehicle accident, near miss, operating error, 'slip, trip, and fall', or struck by moving object. Findings were compared between the sectors and reported as basic counts and frequencies.

The power utility granted permission to analyse the health and safety incident data. The study was approved by the Faculty Research Committee of the Central University of Technology, Bloemfontein, and the Health Sciences Research Committee of the University of the Free State (Ethics clearance number UFS-HSD2020/1714/2302).

RESULTS

Health and safety incidents

Six hundred and fourteen health and safety incidents occurred in the period 2015 to 2019 (Table 1). The most common incidents in all eight sectors, and overall, were motor vehicle accidents (n = 482, 78.5%), followed by damage to equipment (n = 48, 7.8%). Other notable incidents were falls (12.5% in Grahamstown), hand injuries (9.8% in East London and 4.3% in Uitenhage), animal/insect bites (8.2% in East London), and electrical contacts (4.3% in Uitenhage and 3.6% in Butterworth). Only one near miss was reported in East London.

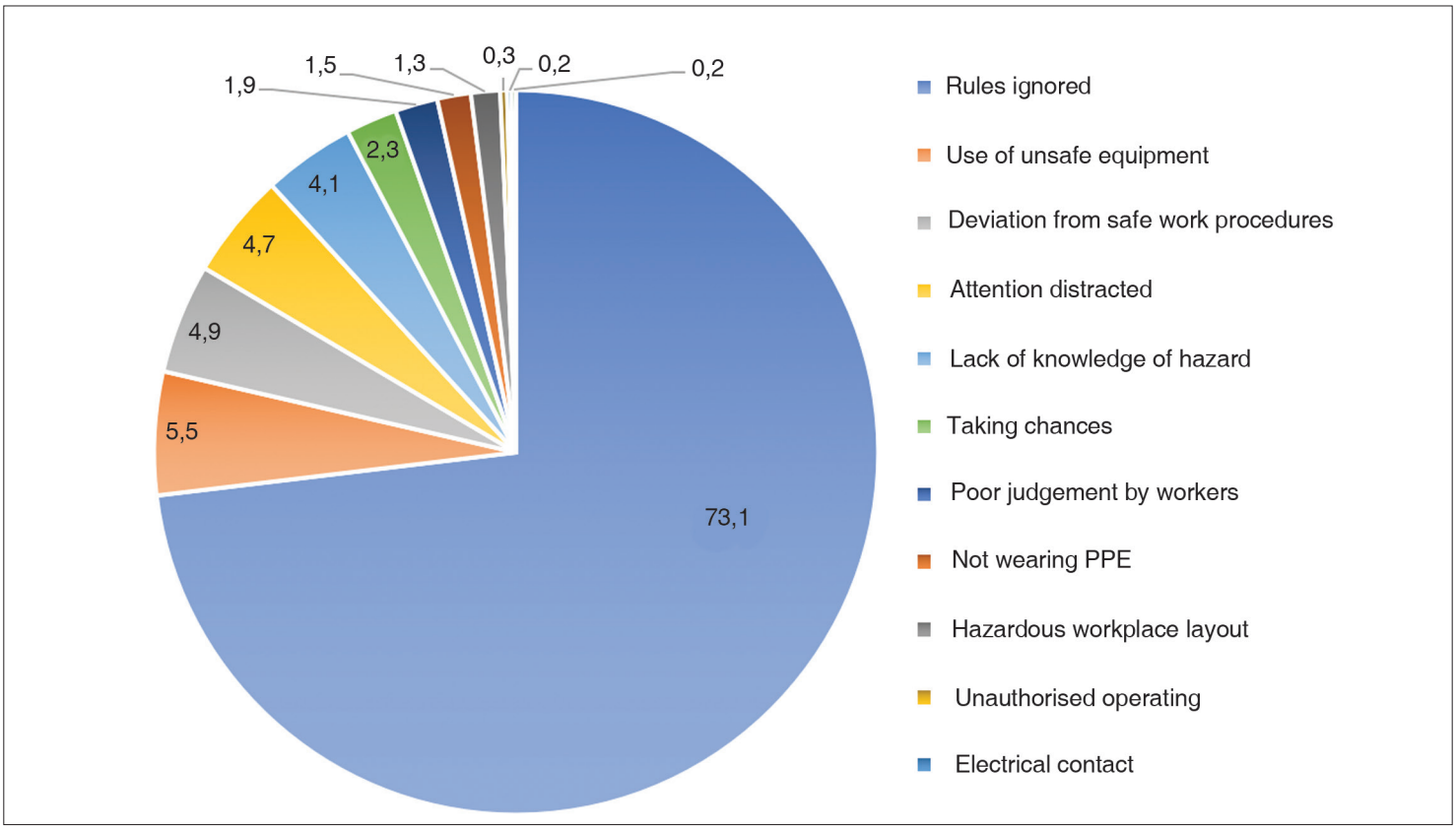


Figure 1. Factors contributing to workplace health and safety incidents, 2015–2019 (N = 614)

As shown in Figure 1, the highest proportion of health and safety incidents were reported to be caused by workers ignoring safety rules (n = 449, 73.1%). Other causes were the use of unsafe equipment (n = 34, 5.5%), deviation from safe work procedures (n = 30, 4.9%), distraction of attention (n = 29, 4.7%), and lack of knowledge of hazards (n = 25, 4.1%).

DISCUSSION

Industries that have high-risk or construction-related activities are known for their poor performance regarding health and safety, which translates into high accident and injury rates.[8] Economic growth in both low- and middle-income countries and high income countries can be adversely affected by high rates of workplace health and safety incidents.[10,11]

The activities performed at the different sectors of the power utility are regarded as being high risk and result in health and safety incidents, and injuries. Motor vehicle accidents were the most frequent type of incident type in the eight sectors of the power utility in the Eastern Cape province, followed by damage to equipment, operating errors, falls, hand injuries, and animal/insect bites.

More motor vehicle accidents were reported in the Lukhanji and Mthatha sectors than in the other sectors. These two sectors provide maintenance on the distribution network in the rural parts of the Eastern Cape. The workers drive long distances on gravel roads to maintain and repair electricity network structures. The condition of the roads is poor, which contributes to the occurrence of road accidents. Fatigue can be induced by long driving distances on gravel roads. There is a correlation between driver drowsiness and motor vehicle accidents. Fatigue reduces concentration and leads to poor decision making and errors when driving. The frequency of motor vehicle accidents in the power utility could be reduced by drivers taking regular rest breaks during long-distance driving. The development of a travel route risk assessment tool is necessary to ensure that the drivers are aware of the road conditions before undertaking a journey.

Incidents related to damage to equipment made up almost 8% of all reported incidents. Safe work procedures are developed for every task performed by the workers in the power utility, which, if followed, ensure the protection of workers against injury and equipment against damage. It is essential to communicate safe work procedures effectively and regularly to the workers.

Incidents due to operating errors were also relatively common in the eight sectors of the power utility, and occur when workers fail to follow instructions from the controller while operating on the electrical network. Training workers on operating instructions promotes awareness of safety risks associated with operating errors. Regular assessments of operating procedures, including observations of workers, can assist in evaluating competencies.

Falls were also relatively common incidents in the power utility; workers use fall arrest systems when working at heights, but unsafe use of such systems leads to injuries and fatalities. Training and awareness about the safe use and limitations of the fall arrest system are important in preventing falls.

Hand injuries result in worker disability, reduced productivity at the workplace, and significant financial burden. A lack of awareness of physical risks while performing high-risk work is a barrier to preventing hand and other injuries.

Animal/insect bite injuries made up a small proportion of the incidents. Animals and insect bites are common in rural areas, although not necessarily directly related to the workplace. There should be a facility at the workplace to deal with poisonous and venomous bites, including snake bites, dog bites, cat bites, bee stings, etc.

Despite that fact that South African legislation requires the reporting of near-miss incidents in the workplace,[1] only one such incident was reported across the eight sectors in the five-year study period. Lack of reporting of near misses hinders the identification and implementation of preventive measures that may reduce the occurrence of injuries.[12] It is important to train workers about the importance of reporting near-miss incidents from a legislative point of view, but even more importantly, to avoid injuries in the future. Near-miss incidents can be used to identify workplace hazards and implement measures to prevent health and safety incidents from occurring.

In industries where workers perform high-risk activities, the employer must conduct observations of the workers' activities. There appeared to be a lack of personal safety responsibility among workers in the eight sectors of the power utility, as most of the health and safety incidents were reportedly caused by workers ignoring safety rules. Motor vehicle accidents, damage to equipment, hand injuries, falls, and operating errors could be attributed to negligence and disregard of protocols and safety rules. This suggests that there is a strong relationship between employee attitudes and health and safety incidents. Stringent measures are needed to enforce legislated employee safety responsibilities in the workplace. Health and safety incidents can be reduced if workplace health and safety culture and employee attitudes and behaviour are aligned.

One of the limitations of our study was that the analysis of health and safety incidents was confined to the power utility's maintenance and operations department in the Eastern Cape province. Incidence per sector could not be calculated as we did not have information about the size of the workforce in each sector. We did not investigate associations between incidents and causes, beyond what was reported. Future analyses of the power utility's health and safety data could include the association of incidents with socio-demographic factors, such as age and duration of employment, awareness and perceptions of hazards in the workplace, and workplace factors.

The power utility in the Eastern Cape province is in the early stages of implementing a health and safety management system, which could reduce the frequency of health and safety incidents and improve health and safety performance. The data should be analysed again after the management system has been implemented to evaluate the success of the intervention.

CONCLUSION

Motor vehicle accidents, damage to property, operating errors, falls, hand injuries, and animal/insect bites were reported in the eight energy utility sectors in the Eastern Cape province in the period 2015 to 2019. Workers ignoring health and safety rules was the most common recorded cause of these incidents. Training workers on the importance of reporting incidents, including near misses, would go a long way to reducing the frequency of health and safety incidents. The implementation of a health and safety management system can improve the health and safety culture at the power utility.

KEY MESSAGES

1. Motor vehicle incidents were the most common type of health and safety incident in the power utility in the Eastern Cape province.
2. Ignoring health and safety rules at work is associated with occupational injuries.
3. The implementation of a health and safety management system might reduce the frequency of health and safety incidents in the eight power utility sectors.

DECLARATION

The authors declare that this is their work; all the sources used in this paper have been duly acknowledged and there are no conflicts of interest.

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AUTHOR CONTRIBUTIONS

Conception and design of the study: NQ, KL
Data acquisition: NQ
Data analysis: NQ, KL
Interpretation of the data: NQ
Drafting of the paper: NQ, KL
Critical revision of the paper: NQ, KL, NM

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7th International Conference on the History of Occupational and Environmental Health

15–17 November 2023, Durban, South Africa

Conference abstracts

The 7th International Conference on the History of Occupational and Environmental Health was organised by the Scientific Committee on the History of Prevention of Occupational and Environmental Diseases of the International Commission on Occupational Health (ICOH). Held at the University of KwaZulu-Natal during 15–17 November 2023, the conference was the first since the planned 2020 conference was cancelled due to the COVID-19 Pandemic. The conference theme, *Occupational and Environmental Health: At the Crossroads of Migrations, Empires and Social Movements*, brought together occupational and environmental medicine specialists, epidemiologists, social scientists, and historians to debate the issues facing workers and communities in their struggle for a healthier life. The scientific programme focused on the migration of workers in various time periods, the interconnections of empires, public health in post-colonial periods, and the role of trade unions and other social movements in occupational and environmental health. The evolution of occupational and environmental health in Africa, as well as globally, was addressed.

This was the first time the conference was held in Africa, and it was attended by approximately 100 delegates from about 20 countries. There were over 50 presentations given by participants from every continent, with the majority of these from African delegates. The abstracts from our keynote, lead, oral, and poster presenters are published in this issue of *Occupational Health Southern Africa*, the official conference publication, and a conference sponsor.

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Keynote and lead talks

Between adulation and denunciation: the institutional benefits of ambivalence in the history of occupational medicine

Breckenridge KD

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A consensus exists in the history of South African occupational health that tracks back from McCulloch to the very earliest writings on the gold mines. There is a general scholarly agreement that the mines have acted as engines of disease in the subcontinent, and that the medical interventions and forms of compensation offered by the institutions of industrial medicine amounted to – at best – weak and ineffective remedies, or – at worst – masks of ongoing contamination. In this talk I offered a critique of this consensus, asking – in light of the rapid decline in industrial employment and the widespread collapse of associated state institutions – what was internationally interesting and significant about the century of South African industrial medicine, and what it means for public health that the field no longer exists.

Artificial stone silicosis as a new public issue: the Spanish case

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Over the past fifteen years, Spain and Israel have each become 'Ground Zero' for an unexpected outbreak of silicosis among workers involved in cutting, bevelling, and polishing high-silica-content material, often called 'artificial stone'. These two countries house the main producers of this material, worldwide. Medical reports have described accelerated forms of silicosis in young healthy workers exposed, and (more rarely) have paid attention to immune-mediated diseases associated with crystalline silica. Several health agencies have recommended lower occupational exposure limits (OELs). However, exposure is still active in Spain, Israel, and worldwide.

Andalusia, the most populous Spanish autonomous community, has been especially affected by this outbreak. Demand for artificial stone was fuelled by the housing boom during the first decade of the century, giving rise to intensive occupational exposure in small workshops. From 2007 to 2019, 3 320 cases of occupational diseases due to exposure to crystalline silica recognised in Spain, can be identified with a specific industry code. Of these cases, 1 856 (55.9%) were attributable to the production and manufacture of artificial stone, of which 266 were reported in Andalusia. In 2017, an Integrated Silicosis Programme for managing quartz agglomerates was implemented by the Andalusian Regional Government.

This paper explored the ways in which different stakeholders have coped with the silicosis outbreak in Andalusia and how this epidemic has challenged the traditional understanding of silica hazards. The aim was to illustrate how artificial stone has become what is defined by the social sciences as a 'public issue'. This research is drawn from a variety of sources, including interviews with local agents, medical and public health experts, and administrative and epidemiological data.

Working and breathing in global Africa

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For over a century, African minerals have played a particularly important role in fueling industrialised life across the globe. Today, the toxic residues of mineral extraction and use continue to plague communities throughout the continent – along, of course, with more recent forms of industrialised contamination. As the planet's environmental crisis continues to worsen, I argued that – contrary to stereotypes of Africa as marginal and 'lagging' behind other continents – we must look to African experiences to understand the present and future of working and breathing on our planet. I explored this theme through two examples: large-scale gold and uranium mining in South Africa's Gauteng province, and air pollution in west African cities.

Occupational lung diseases in mine workers in South Africa

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The mining sector is a major driver of economic growth in South Africa, contributing some eight percent to the country's gross domestic product in 2022 and significantly to its foreign exchange earnings. However, despite the central role of mining in South Africa's economy for over 150 years, the associated health impacts have had a negative effect on mining communities, with mine workers in the southern African region historically registering the highest incidence rates of tuberculosis (TB) of any working population in the world. Before the 19th century, South Africa had a pastoral and subsistence economy, with Cape Town being a way station for passing ships on their way to and from the East for the colonial powers and 'explorers'.

The discovery of diamonds in 1867 and gold in 1884 led South Africa on an economic trajectory that surpassed many countries. The mining economy sucked in migrant workers from many countries, especially those in southern Africa. As part of the political economy of mining, various legal instruments assisted in dispossession of Africans of their land, and imposition of various taxes moved many into a cash economy based on migrant labour. The Anglo-Boer war dispossessed the Afrikaner population, and the scorched earth policy of the British ensured that farmland was destroyed, also leading to Afrikaner men seeking employment on the mines.

The medical assessments of white workers for their employment on the mines were undertaken by state-employed doctors, given the distrust of white workers of the doctors employed by the mining companies. Black African workers were assessed by medical orderlies based at The Employment Bureau of Africa (TEBA) facilities in labour-sending areas/countries or in Johannesburg. The compensation systems for occupational injuries and occupational lung diseases in mine workers were initiated in 1894 and 1912, respectively. The occupational lung diseases compensation system covered white workers until 1973. Research was conducted by the South African Institute for Medical Research (SAIMR) into vaccines and treatment interventions for various communicable diseases in mine workers and two major international conferences covering silicosis/pneumoconiosis were convened in South Africa as early as 1930 and 1959. The lack of preventive interventions resulted in the major class action settlements from 2002 onwards in the asbestos and gold-mining sectors. Social protection rights for Black African workers were only realised in the 1970s, after the historic Durban strikes for collective bargaining and trade union rights.

The mining sector, through the Minerals Council South Africa, has a legacy programme in partnership with the Department of Health that recognises the injustices of the past, and has taken corrective steps to restore the dignity of current and ex-mine workers and peri-mining communities that will ensure the sustainability of the sector.

Decolonising occupational health: informal workers and the struggle for occupational health

Lund F

Senior Advisor, WIEGO Social Protection Programme

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Against the background of informal work, and the intersection of the location of formal occupational health and safety (OHS) with formal work and workplaces, on the one hand, and global changes in the world of work on the other, WIEGO (Women in the Informal Economy: Globalising and Organising) undertook research that aimed to explore and assess potential points of entry for the extension of OHS to the majority of workers in the global south, who are informal workers often working in informal workplaces. WIEGO is a global research and advocacy organisation. Starting in 2010, WIEGO worked through and with affiliated informal worker organisations in Brazil, Peru, Ghana, Tanzania, and India. Those involved were poorer workers in cities, with a focus on poorer women. The occupational sectors were industrial outwork (piece rate work in private homes), street and market vendors, waste pickers, and domestic workers. Key aims of the study were to understand the risks faced by workers in their workplaces; identify how to modify legal and institutional barriers to including informal workers and workplaces in OHS; understand the allocation and control of primarily municipal resources to informal workers; support organisations to make focused demands for OHS interventions; and help to build in-country research and organising capacity in OHS for informal workers.

Based on this empirical work, the paper presented lessons learned for policy development at local, national and international levels, and for practical implementation at municipal level. While the challenges in moving towards a more inclusive OHS practice are enormous, the comparative country research initiative points to avenues that can be pursued towards a post-colonial vision of OHS. This will require, however, a serious and sustained commitment from intellectual and professional leaders in the occupational health discipline.

Guardians of workers' bodies? Trade unions and occupational health and safety

McIvor A

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This presentation contributed to an ongoing conversation on the role trade unions have played in occupational health and safety (OHS). The activities of unions were examined through the lens of experience in Britain, focusing on three themes: firstly, the idea within some of the literature that historically unions neglected workers' health, especially chronic ill-health and industrial disease; secondly, the challenges to this negative portrayal that support a rehabilitation of the historic role of unions; and, finally, the recent experience (since c1980) of unions in decline (and under attack), and the impact of this on OHS standards. It was argued that the role of trade unions needs to be contextualised and that tensions existed within some unions over jobs, wages, and health. Also, that we need to know more about working-class environmentalism. Nevertheless, there is robust and compelling evidence to support the argument that unions were, and continue to be, a powerful countervailing force operating as the key sentinels protecting workers' bodies in production. This has been a significant buffer in hard times.

It is also undeniable that capacity to resist and to mediate these wider degenerative forces has been critically neutered now that less than a quarter of the UK workforce are union members and collective bargaining has dissipated. Occupational health standards have worsened in the process, though this manifests itself now (at least in developed economies like the UK) less in physical injury and disability (though these legacies are still visible and continue to blight traditional working-class communities), and more in deteriorating psycho-social health with the stress epidemic in the modern workplace. Workers' bodies and minds are again bearing the brunt of a profound economic transformation.

The European greed for gold and silver, slavery, and the development of occupational health

Stanton, DW

Consultant

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The author, after producing a *Silicosis Prevention Information Resource, including an Historical CD* containing copies of the bulk of the known publications on dust prevention for the South African gold-mining industry, became involved as a consultant to legal teams in the silicosis litigation class actions for and against the South African (SA) gold-mining companies. Historical work conducted for this litigation influenced the author to research how African slavery was able to influence the poor working conditions in the SA gold mines. This work then influenced the author to conduct further extensive research for a possible book, viz. *The European Greed for Gold and Silver, Slavery, and the Development of Occupational Health*.

Brief information was presented from three of the thirty proposed book chapters: 'Hispaniola', 'New Spain' (Mexico), and 'The Welsh Slate Industry'. This covered the first Spanish missionaries who were sent to the Indies (the Americas), and their efforts to try to improve working conditions for Native Americans forced to work by the Spanish colonists at the gold and silver mines. Some of the early Spanish Crown letters and instructions sent to protect African slaves and Native Americans in the Indies were also discussed.

The talk ended with brief information on the Welsh slate industry, which was originally funded from African slavery, and on the very distinguished nineteenth-century geologist and mining engineer, Sir Clement Le Neve Foster. He served as one of the first Inspectors of Metalliferous Mines in the United Kingdom from 1872, and from 1880 until his retirement in 1901 was the Metalliferous Mines Inspector for the North Wales District, where he also had responsibility for the underground slate mines. Some examples were given of his conspicuous service to protect the health of metalliferous and slate miners in the nineteenth century.

Oral presentations

Importance of historical information for exposure assessment in the soft tissue paper industry

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Wood pulp production on a industrial scale started at the end of 19th century and became an important industrial product in Sweden. At around 1920, Sweden became the largest exporter worldwide of pulp. In the early 1940s, the production of crêpe paper and soft tissue paper started, mainly for the production of toilet paper, a product increasing used. Currently, the demand for soft tissue paper is still growing, especially in Asia, and production is increasing. One method to assess exposure in retrospective, historical cohort studies is to apply job exposure matrices (JEMs). This methodology started in the early 1980s and has been used both for general populations and industry-specific exposure assessment.

We have collected data from the very early soft tissue paper-mills in Sweden, comprising a cohort of 8 624 workers who started to work in the mills from the late 1940s. We performed exposure assessments with regard to paper dust and noise, based on dust measurements starting from the 1970s from the mills. A total of 1 578 dust samples and 1 157 noise measurements were assessed. The exposure from the late 1940s to 1980 was based on reviews of historical trade association books that described changes in equipment, processes, management, and economics over the history of every paper mill in Sweden. In-depth interviews were conducted with previous and current personnel – including operators, supervisors, and upper management – to understand how working conditions in all sections of each mill had varied over the years.

From all our information we developed two mill-specific semi-quantitative JEMs; a dust JEM with seven levels from 0.01 to >10 mg/m^3, and a noise JEM with seven levels from < 75 to > 100 dB(A). For every year, department and job title categories were data populated and assigned exposure levels that were used for analyses of different health outcomes. Dust exposures are considerably reduced but noise exposures are still high.

The history of MEDICHEM and the ICOH SC on the chemical industry

Coombs WM

Retired Occupational Medicine Specialist, Past President MEDICHEM and Chair ICOH SC CI

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A synopsis was given of the chemical industry up to 1972, the reasons for the establishment of MEDICHEM so as to serve occupational health (OH) in the chemical industry, affiliation with ICOH, and the Board of MEDICHEM approved as the ICOH Scientific Committee (SC) for the Chemical Industry.

We explored the archives of MEDICHEM and the SC, and now, close to fifty years later, we documented the successes, failures, needs for change, the future, and how this will affect OH in the chemical industry.

The last fifty years, as for the beginnings of chemistry, have brought much to be debated. The context of sustainable development (responsible care, corporate citizenship, green chemistry), new, emerging, and old technology, and the impact on and by OH professionals, ethics, and the future of the relationship of OH professionals within the chemical industry, was further explored as a finding during the search and archiving of the history of MEDICHEM and the SC.

In addition, the format of publication of such archiving and documentation was discussed, with the ICOH repository as a backdrop.

Metal working fluids and bacteria

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Metal working fluid (cutting fluid) has historically been used during the 20th century in industry for processes such as grinding, turning, drilling, and milling. Since the 1970s, various types of non-mineral oil-based metal working fluids, including synthetic fluids, have been used in Sweden.

The mean exposure to cutting fluids in the form of either oil mist or aerosols has decreased over time in many countries, using personal monitors: 1.23 mg/m^3 during the 1970s; 0.57 mg/m^3 during the 1980s, and 1.0 mg/m^3 during the 1990s. In Sweden, we can see the same trend; in the 1970s 5 mg/m^3 oil mist, during the 1980s around 3 mg/m^3 oil mist, and in the 2010s 0.2 mg/m^3 aerosols.

Today, the average machining speed of the new machines is two times higher than for machines 30 years ago, and we know that aerosol generation increases with increasing machine rotating speed. From Swedish studies, we can show that using compressed air over many years, working with half-open machines, and grinding are important factors in exposure to inhalable aerosols and in governing exposure levels.

In the 1990s, the workers were exposed to oil mist/aerosols of metalworking fluid containing *P. pseudoalcaligenes*. Twenty years later, we can see the same bacteria genera grow and many other gram-negative bacteria such as *Escherichia coli* and *Legionella ssp.* Today, we can find *Mycobacterium immunogenum* in MWF containing mineral oils. Bacterial content of the cutting fluid varies depending on the cutting fluid type and biocidal additives, and can vary between the tank and in the machine.

History of the *Braceros* – migrant labourers in California, US

Das R

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In response to labour shortages during World War II, the *Bracero* programme enabled 4.6 million Mexican migrant men to work temporarily in the United States (US). The programme began in 1942 but continued until 1965, well after the War. Workers (*braceros*) primarily served Californian agriculture. This presentation described the history of the largest guest worker programme in US history, focusing on occupational health and social issues. Sources included: published articles, unpublished reports and public access documents, and historical archives. While the programme helped provide cheap labour, *braceros* suffered from poor working conditions and mistreatment by US employers. The US- and Mexican Government-backed programme promised a minimum wage, sanitation, housing, food, and protection from racial discrimination. It attracted many impoverished rural Mexicans desperate for work. In reality, however, the selection process for *braceros* was lengthy, humiliating, and tainted by corruption. Agricultural employers frequently ignored governmental guarantees, resulting in unpaid wages and substandard food and housing. The work was demanding and hazardous. While injury data specific to *braceros* were not collected, in 1957 there were 50 disabling injuries/1000 workers in agriculture versus 32.4 disabling injuries/1000 workers in all industries. Piece-rate compensation, the need for rapid work, and improper tools likely contributed to high rates of injuries. Ignored safety regulations and transportation accidents resulted in numerous fatalities. *Braceros* were unable to improve their working conditions, as they were denied the right to representation and collective bargaining; those who filed complaints and insurance claims faced retribution and deportation. The programme ended due to increasing recognition of the hazards faced by workers, expansion of mechanisation, and a successful labour movement leading to the formation of the United Farm Workers. The *Bracero* programme allowed the US agricultural industry to grow, while severely exploiting individual Mexican workers and influencing trade agreements to this day.

Silicotuberculosis – unstable in history and neglected in science

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Background: What we today distinguish as silicosis and pulmonary tuberculosis have a long but contested history of biological, epidemiological and nosological association.

Methods: To try to illuminate this history, the South African published literature on gold miners over the past 100 years was examined to describe how co-occurrence and separation have been conceived.

Results: Between the turn of the 20th century and the 1930 Johannesburg Silicosis Conference, there was continuing debate about whether the 'infective component' of 'miners' phthisis' was always present in disabling silicosis. The conference established that the diseases, irrespective of severity, were distinct. The phenomenon of subradiological silicosis was ignored in the new definitions. Mid-century papers attempted to distinguish, inter alia, between 'silicotuberculosis' and 'tuberculo-silicosis' on grounds of chronology of dust and mycobacterial exposure and pathogenesis. By contrast, medical commentators in the mining industry challenged the aetiological linkage of the two diseases into the 1980s. Even where it was accepted, it was argued that silica in the absence of silicosis was not a causal factor, ignoring biological evidence to the contrary. While clinicians continued to emphasise the co-occurrence and diagnostic complexity of combined disease, epidemiological and laboratory studies on co-occurrence remain scarce, both in South Africa and globally.

Conclusions: Despite a century of intimate (and tragic) association of silica and *Mycobacterium tuberculosis* in the South African gold-mining industry, the varying, multiple, and ultimately unstable understanding of what is today called silicotuberculosis, along with historical resistance within the South African mining industry, have hindered scientific inquiry.

Advancing our understanding of migration, work, and health by exploring our historical roots in social medicine

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Occupational health has evolved into a fundamentally technical and applied field dedicated to identifying and eliminating hazards found at the workplace. While this approach has led to significant reductions in occupational injury and illness, it has limited its ability to account for the social structures that circumscribe occupational health outcomes, particularly for socially marginalised populations such as immigrant workers. It has also led to the artificial, yet fundamental, distinction between work-related and non-work-related exposures, injuries, and illnesses, which has evolved into a line of demarcation between occupational safety and health and other disciplines within public health such as migrant health.

This presentation discussed key concepts that have been central to the development of occupational health over time. Specifically, it explored occupational health's historical roots in social medicine and how historical advances, such as the establishment of a regulatory infrastructure, may have inadvertently contributed to its increased reliance on reductionist views of cause and effect that are prevalent today. It discussed the predominance of the biomedical paradigm in occupational health, and how this has limited the field's ability to address occupational health inequities for socially marginalised groups such as immigrants. Finally, it discussed the advantages of moving towards a bio-social approach to health and how this could lead to a more comprehensive understanding of the relationship between work and health. This understanding could also allow the field to better address the changing nature of work arrangements and the inequitable distribution of occupational health outcomes across the social axis.

A history of the Mine Medical Professionals Association

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A few decades into the great Gold Rush of 1886, mine medical officers found themselves at the crossroads of migrations, empires, social movement, and diseases. There was a gradual unanticipated, but disturbingly extensive, burden of ill health among manual labourers from indigenous Black African populations, who were recruited locally and from neighbouring countries.

Following a meeting in March 1921 held under the aegis of the Chamber of Mines, the Mine Medical Officers Association (MMOA) was established. The first Constitution set out two principal objectives, viz. to discuss problems of special interest relating to the work of mine medical officers, and to foster friendly intercourse and exchange of views among the Association's members and other organisations connected with the mining industry.

The history of the Association is replete with scientific papers written by its members, from as early as 1924, on scurvy, meningitis, injuries, and sepsis, and, in later years, silicosis, tuberculosis, HIV, and hearing loss – proof that the Association had not only achieved its mission but had become a leader in the management of occupational diseases. Evolving from an era steeped in safety culture, the Association steered its members towards ensuring the prioritisation of health, along with safety.

In its first 50 years, the name of the Association changed to the Transvaal Mine Medical Officers' Association, and then back to the MMOA to accommodate members from the Free State mines. In 2009, to incorporate other medical professionals and sustain its membership, it was renamed the Mine Medical Professionals Association (MMPA).

The MMPA has enjoyed a meritorious journey, fostering preventive healthcare and promoting occupational health as enablers for safety in mines. As an Association, the MMPA has achieved its vision of *"raising the profile of medicine in mining"* in the last 100 years. It celebrated its centenary in 2021.

The colonial legacy of mercury toxicity: the story of Thor and a tribute to Mark Colvin

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Margate, a picturesque town in Kent, England would be the ominous setting of a terrifying legacy to unfold thousands of miles away in South Africa. Margate was home to Thor Chemicals, the manufacturer of mercury-based products.

In the late 1970s, concerns were raised by the Health and Safety Executive (HSE UK) about the excessively elevated airborne levels of mercury and high levels of mercury in the workers' urine. In 1987, the HSE delivered an ultimatum to Thor Chemicals – to shut down processes or face prosecution. Thor chose to relocate to the remote, semi-rural Cato Ridge, in KwaZulu-Natal, South Africa in 1988.

In South Africa, Thor transformed its English mercury production process into a mercury reclamation and recycling process. Escaping international and national scrutiny, Thor became the global leader in mercury waste recycling. In 1989, toxic mercury deposits were discovered in the nearby river. Workers began exhibiting symptoms of mercury poisoning. Urine levels of workers were found to be at least 12 times higher than the World Health Organization (WHO) limit, with workers complaining of *"going mad"*.

Protests in 1990 by non-governmental organisations and the Chemical Workers' Industrial Union (CWIU), and investigations by Dr Mark Colvin, exposed the extent of mercury toxicity among the workers. By 1994, three workers had died from mercury poisoning and 32 workers had urine mercury levels of > 200 mg/l. The Government's Department of Labour fined Thor R13 000!

In 1994, a civil claim of culpable homicide was filed against Thor Chemicals in the Court of London. In 1997 and 1998, Thor settled, paying R17 million to affected workers.

Despite its 1998 announcement of the closure of its plant, more than 10 000 drums of mercury waste remained improperly stored, stockpiled with evidence of seepage into the surrounding environment as recently as 2019.

In August 2019, a fire destroyed at least 30% of the mercury waste and released toxic waste. In October 2019, after pressure from the South African Government, a Thor Chemicals subsidiary agreed to pay R300 million to clean up the mercury waste and transport it to a Switzerland company.

While the cycle of exportation of hazards from Europe and back is complete, some thirty years later, in its wake the destruction of the lives of workers, their families, their communities, and the farming environment remains the legacy.

OHS programmes nurtured from tailings of mines

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A mine's history of injuries and fatalities was addressed with occupational health and safety (OHS) programmes developed, from1923, by its medical director, Paul Richards, MD (born 25 November 1892). These efforts subsequently fostered academic programme development.

Background: Great human migrations are invariably motivated by economics. Mining is the penultimate example of massive 'rushes', although more have migrated for agricultural and manufacturing opportunities. Irrespective of economic driver(s) in the rushes to riches, occupational health is often an after-thought.

Mine history: Bingham Copper Mine in Utah is the world's all-time greatest copper mine. Mining began in 1863, and production is now 19M/17.2M short/metric tons (~$416B in inflation-adjusted total value). After arriving at Bingham, Utah on 7 October 1922, Dr. Richards took over the town's hospital, his employer, and began accident investigations, injury prevention programmes, and respiratory protection. Mining deaths were eventually all but eliminated. Dr. Richards also helped write Utah's Occupational Disease Act (1941). However, most OHS activity was relatively dormant after his death on 20 November 1958.

Hopeful future: An OHS rebirth with business-labour partnerships, built on Dr. Richards' legacy in the mining industry, is now accelerating. Efforts are spearheaded by a coalition of partners of the University of Utah/Weber State University Rocky Mountain Center for Occupational and Environmental Health (est. 1977). A series of state laws have been enacted including: (1) funding support through tax credit mechanisms (SB159, 2005 General Session (GS)); (2) incorporation of the Center into state law (1SSB234, 2007 GS); (3) statutory Center enlargement to involve a second university (2SSB172 2021GS); and (4) new, ongoing state appropriations (2022 and 2023).

Conclusion: This example shows that with industry-labour historical partnerships and government support, broad advances in OHS programmes with disease and injury reductions are possible.

https://www.mining-technology.com/projects/bingham/

https://miningdataonline.com/property/357/Bingham-Canyon-(Kennecott)-Mine.aspx

Jean Rodier: a pioneer in occupational medicine in Morocco

Hicham C

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Jean Rodier (3 April 1920–9 June 2003) arrived in Morocco by accident in September 1945. He became attached to the country and decided to return the year after he received his doctorate in pharmacy, to work at the Institute of Hygiene of Morocco in Rabat.

In 1946, he was appointed Head of the laboratories of toxicology and chemistry-physics at the Institute of Hygiene of Morocco. He carried out considerable work in the field of individual toxicology and was designated in this capacity as an expert at the Moroccan courts, including the Court of Appeal.

In Morocco, he was particularly interested in the mining toxicology of lead, cobalt, antimony, phosphates, and – especially manganese. He focused on the disease related to manganese, viz. manganism. This exceptional work spanned nearly twelve years, combining field research, biological essays, dust analysis, and animal testing at the Institute of Hygiene. The outcome of this research was a twenty-minute medical short film on manganism, which was given an award at the 20th Congress of Occupational Medicine in Helsinki in July 1957.

He also authored a significant number of works in the field of water. These were grouped into a 125-page introductory book, first published in Rabat in 1951. In 1956, he published a second book, the *Manual of Biochemistry Practice*, which gathered the teaching courses he gave while he was a professor at the School of Laboratory Technicians of Morocco (1948–1958).

He was appointed Head of the Industrial Hygiene Laboratory in Morocco from 1955 until his departure in 1958, and organised the Centre for Studies and Research on Occupational Hygiene in Morocco in 1956, at the dawn of independence.

During his twelve-year stay in Morocco, Jean Rodier wrote 70 articles, almost all in French, favouring national journals including *Bulletin de l'Institut d'hygiène du Maroc* and *Maroc médical*. He also occasionally published in *Les Archives des maladies professionnelles* and authored a review in *La Revue neurologique* in 1954.

He won the medical prize of Morocco in 1949 for his work on manganism, and the scientific prize of Morocco in 1957. He was decorated Knight in the Order of Academic Palms on 3 January 1961, for all the work he achieved while he lived in Morocco.

A hidden history – perspectives on the role of women in the history of OEHS in Africa in the past 60 years

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This paper addressed the understudied subject of women in the history of occupational and environmental health and safety (OEHS) during the last 60 years in Africa. It is a period of critical importance for the economic development of Africa. The past 60 years has seen many countries in Africa gain their independence, increase their economic growth across both industrial and agricultural sectors, and the emergence of trade unions as well as improved OEHS legislation. However, the role of women in the history of OEHS in Africa is understated.

What is the historic role of women in these developments? Scattered sources of information, including 'grey literature', suggest women have, over the decades, played an important role in OEHS legislation and policy development, in teaching and training, in advocacy for improved conditions of work, for child care and maternity and paternity leave, and for OEHS medical services as well as freedom from violence. To explore this history and start a more informed discourse that encourages research in this area, we obtained perspectives from different OEHS stakeholders and some key informants in several countries in Africa.

The review of records was triangulated with the results of a survey and interviews with OEHS stakeholders and key informants, using a qualitative interview guide informed by a structured literature review. The paper elaborated on how women played an important role in the history of OEHS during this significant economic period of Africa's development. Women asserted their role and contributed to shaping, improving, and remaking subsistence as well as public and private workspaces during this period.

South Africa – occupational health in the non-mining industry: from 1976 to the post-COVID era

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Occupational health in the non-mining sector became an entity recognised by the South African Government in 1976. The Erasmus Commission of Enquiry (1976) into occupational health, followed by the 1979 Wiehahn Commission Report on the Industrial Relations System in South Africa, identified specific legal challenges to be addressed. After nearly 20 years, the Occupational Health and Safety Act (Act No. 85 of 1993) defined in legal terms the occupational health services that would be required. However, much earlier than 1985, non-governmental organisations became pioneers in occupational health.

The South African Society of Industrial Health, constituted in 1948, underwent various changes and was renamed the South African Society of Occupational Medicine (SASOM) in 1985. SASOM, an affiliate member of the International Commission on Occupational Health (ICOH), is tasked with promoting, protecting, and enhancing the quality of life and wellbeing of the working population of South Africa. Its members are medical practitioners registered with the Health Professions Council of South Africa (HPCSA).

In 1966, the Industrial Nurses of the Southern Transvaal met for the first time; during 1976, they changed their name to 'occupational health nurses' to be in line with international standards at that time. Since 1980, the organisation has been known as the South African Society of Occupational Health Nursing Practitioners (SASOHN); its main mandates are promoting occupational health nursing through accredited standards of practice, education, and training, and co-operation with national and international organisations.

Occupational hygiene, as a recognised discipline, came into existence in 1992 at a meeting of the transitional committee of the then Institute of Occupational Hygienists of Southern Africa (IOHSA). At a strategic meeting in 2000, the Southern African Institute for Occupational Hygiene (SAIOH) was launched; it is the officially recognised and accredited professional organisation responsible for the certification and registration of occupational hygiene professionals in southern Africa.

Listening to the unremembered – Chinese indentureship in South Africa

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Notwithstanding the deep history of the South African-born Chinese community, discourses of 'othering' and 'exclusion' continue to be developed around them. The unremembering of Chinese indentureship to the South African Chamber of Mines in the early 20th century, in the so-called 'Chinese Experiment', is a case in point. Over 64 000 Chinese workers were subjected to extreme forms of exploitation, which included exposure to known deadly working conditions, police violence, and the legalised access to narcotics. While international historiography of Chinese indentureship as a system of exploitation is extensive, the post-indentureship fates of Chinese labourers is largely unknown and uncertain. For those indentured in South Africa, even less is known since all were repatriated, excepting a small number of escapees, at the end of the scheme in 1910. The only South African indentured-Chinese labourers for whom we have certain knowledge are the group skeletons held by the Raymond A. Dart Collection of Human Skeletons at the University of the Witwatersrand. By reflecting on the continued possession and use of those skeletons for scientific research, this paper posed broader questions regarding our professional practice. Are we unremembering the migrant workers of the 2022 Qatar Football World Cup? Do mandatory medical measures involve a degree of unremembering? Do our national healthcare systems unremember workers? It was suggested that only a change of paradigm to a worker-centric, service-based model of occupational health and safety, where worker agency is enhanced, will ensure that we, the professionals, listen and remember.

Research on chalk particles: a systematic review

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Chalk dust exposure is the inhalation of dust particles that are generated when using chalk for writing or wiping on a chalkboard. Chalk dust exposure can have negative effects on human health, especially for teachers and students who use chalk frequently in classrooms. Chalkboards were first used in the 19th century in Europe and in the United States of America, and became popular because they were cheap, reusable, and easy to erase. However, they also produced a lot of dust when writing or wiping with chalk. It is known that chalk dust exposure can cause health problems, such as eye irritation, skin irritation, respiratory tract irritation, and mucous membrane irritation. However, the history of chalk dust exposure and related diseases is not well documented. Therefore, this review aimed to assess the history of chalk dust exposure and disease. Some studies have suggested that chalk dust exposure may be associated with an increased risk of asthma, allergies, chronic bronchitis, and lung cancer. In recent years, some alternatives to chalkboards have been developed and adopted in schools, such as whiteboards, smartboards, projectors, and tablets. These alternatives can reduce or eliminate the generation of chalk dust and improve indoor air quality in classrooms. However, these technological tools are not optimally used in countries like South Africa, due to power outages, software failure, malfunction, and theft.

The legacy of the manufacture and use of asbestos-cement in Katanga (DR Congo)

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Hardly anything is known about the health impact of the use of asbestos in sub-Saharan Africa. We attempted to retrace the history of the manufacture and use of asbestos-cement materials in the (former) province of Katanga in the Democratic Republic of Congo (DRC).

During the colonial period, asbestos-cement roofing sheets (generally called '*Eternit*') were promoted for building houses, especially in mining estates. A total of 19 851 tons of unmanufactured asbestos were imported by the Belgian Congo from 1950 to 1959, presumably for supplying two factories producing asbestos-cement materials: Eternit du Congo (ETERCO) in Léopoldville (now Kinshasa), and TRABEKA in Lubudi, Katanga (now in the Lualaba province). The latter plant produced more than 30 million tons of various asbestos-cement products from 1929 to 1977. In addition, 55 719 tons of asbestos-cement products were imported into Congo from 1953 to 1959. No data are available for the period after independence (1960), except for the period 1975–1986, when 6 167 tons of unmanufactured asbestos were imported. Asbestos was never mined in Congo and there is no evidence for environmental contamination by naturally occurring asbestos.

In a recent case report, we attributed the occurrence in a young man of a malignant peritoneal mesothelioma to his exposure to asbestos-cement materials in the house where he grew up, in a mining housing estate in the (former) Katanga.

To this day, roofs of corrugated asbestos-cement sheets are widespread, and often in tatty condition, in urban areas and mining compounds throughout southern Katanga. More cases of mesothelioma are to be expected in the future.

History of occupational health, challenges, and way forward in Tanzania

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Background: Occupational health and safety services are crucial for sustainable development, reducing accidents and diseases. Improved worker health and safety boosts productivity, job creation, and industrial harmony. Since Tanzania's independence in 1961, occupational health and safety standards have been governed by the Factories Ordinance CAP. 288 of 1950. The nationalisation policy of 1967 led to ineffective enforcement of occupational health and safety standards, due to the Government's role as employer, enforcer, and regulator. In the 1990s, factories were privatised, causing management to prioritise production over occupational health and safety. Therefore, the Government established the Occupational Safety and Health Authority (OSHA) in 2001 to improve workplace health and safety, reduce accidents and diseases, and achieve better productivity through enforcement and promotion of occupational health and safety practices.

Methods: This was a review of the published documents related to occupational health in Tanzania. The following published documents were used in the review: Factories Ordinance CAP. 297, promulgated in 1950; Occupational Health and Safety (OHS) Act 2003; National Occupational Health and Safety Policy 2009; A Performance Audit Report on the Management of Occupational Health and Safety in Tanzania of 2013; Occupational Safety and Health Authority (OSHA) Strategic Plan 2021–2026; Occupational Safety and Health – Country profile Tanzania 2014; and Status of Occupational Health and Safety and Related Challenges in Expanding Economy of Tanzania of 2015.

Results: Occupational health services are accessed by less than 5% of the working population in Tanzania. Only 24% of targeted formal workplaces were registered. OSHA has only 45% of the staff needed for them to perform their duties efficiently. Few doctors are qualified as occupational medicine practitioners (< 10 in the country). Over 80% of Tanzanians lack OSH law coverage and occupational health services.

Conclusion: Tanzania needs to develop an effective institutional framework to enhance OHS in the formal and informal sectors. Also, it is vital to develop a solid and effective research capacity in occupational health.

Workers' health and the *Union Minière du Haut-Katanga* in the Belgian Congo

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During the Belgian colonial rule of the Congo (1908–1960), the private company *Union Minière du Haut-Katanga* (UMHK) had a monopoly on the extraction and processing of minerals in southern Katanga, the northern part of the African Copperbelt. Thousands of workers were employed in underground and open-cast mines, and in metallurgical plants producing copper, cobalt, uranium, and many other metals.

The economic and social history of mining in Katanga has been addressed in many scholarly publications. In the first decades, the problem of worker shortage represented a major difficulty for the industry. Initially, men were forcefully recruited from surrounding or even faraway regions to work for three to six months; poor working and living conditions led to high mortality from dysentery and pneumonia. Later, efforts were made to improve hygiene in worker camps, which were initially built following the South African Orenstein model of dormitories. However, largely at the initiative of medical doctors, the UMHK took measures aimed at 'stabilising' the workforce. These measures consisted of building worker camps ('*cités*') with family housing, improving food rations, providing medical care, and educating children. This 'totalitarian' policy was conducted without worker participation; unions were forbidden. Nevertheless, organised forms of resistance did occur, including a violently repressed strike in December 1941. Although occupational accidents and work-related diseases are mentioned in passing, conspicuously little has been published about specific occupational safety and health issues at the UMHK. An interesting experiment, consisting of aerosolising salt solutions to increase particle size in order to prevent silicosis, was conducted in an underground mine, but the outcome of that study is unknown.

Aluminium powder in South African mines

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Numerous unsuccessful silicosis medicinal treatments and preventatives have been used, worldwide, over many decades. Among the most well-known is the Canadian McIntyre Research Foundation's patented aluminium powder, which was used to *"reduce the solubility of silicious material"*, based on animal studies. The compound is approximately 15% aluminium metal and 85% aluminium oxide. It was administered to silica-exposed miners in countries such as Australia, Canada, Chile, and Mexico, and factory workers in the USA and England, and possibly elsewhere, as a prophylaxis against silicosis. The powder was dispersed into specific areas in the workplace, such as change rooms, or inhaled directly by workers from the 1940s into the late 1970s. Mostly without their formal consent, and sometimes as a condition of employment, tens of thousands of workers were exposed to the powder: 27 000 in Ontario, Canada, alone.

Despite its widespread use globally, and the high rates of silicosis among South Africa's hundreds of thousands of gold miners, aluminium powder was not introduced into the country. We examined the reasons for the lack of enthusiasm for the 'treatment' in South Africa, notwithstanding its potential commercial advantages, being cheaper than dust control. The presentation relied, in part, on an influential 1963 report of an investigation by Prof. Ian Webster from the Pneumoconiosis Research Institute in South Africa. Webster concluded that *"There is no proof that aluminium powder has prevented the development of silicosis"*, and that *"Aluminium prophylaxis does not stop the progression of silicotic fibrosis"*, but, somewhat surprisingly, recommended that *"Should the State or an industry wish to use aluminium prophylaxis, the Pneumoconiosis Research Unit should assist them"*.

Asbestos in Brazil: the process of creating agendas, subjects, and policies

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The aims of this work were to analyse the process of creating agendas, subjects, and policies concerning the production of asbestos in Brazil. It also identified and studied the Brazilian legislation on the use of asbestos, focusing on the actions of the various actors involved, and describes scientific debate on the issue. Exploratory research of a qualitative nature was carried out, using documentary research from 1970 to 2019, and drawing on theoretical contributions from the fields of sociology and history, with special attention focused on Kingdon's work. The complexity of the interrelations between actors and the State in the formulation and implementation of public policies was demonstrated. Asbestos has been on the decision-making agenda several times, but the creation of a national public policy has occurred on only a few occasions. The use of asbestos was banned by the Federal Supreme Court, but the actors involved in the matter continue to duel.

Reconstructing the fragmented history of 'Colinet-Caplan syndrome'

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The first description of an association between rheumatoid arthritis (RA) and pneumoconiosis is generally attributed to Anthony Caplan, who reported in 1953 on a 'peculiar' pattern on chest X-rays of south Wales coal miners with concomitant RA and pneumoconiosis. As early as 1950, however, Émile Colinet, a Belgian rheumatologist at the Saint-Pierre Hospital in Brussels, had described a 30-year-old woman with a ten-year history of diffuse rheumatic arthritis that had started two years after beginning work *"in a factory where large quantities of silica flour were handled"*. Her chest X-ray – which Colinet did not provide – was described as 'silico-tuberculosis'. In March 1953, he reported a 34-year-old woman with clinical manifestations of both RA and scleroderma, who at age 15 had begun work in the same factory – without specifying what this factory produced.

The picture became clearer in December 1953 when Clerens, a colleague of Colinet, recapitulated the two case histories of what he called, by then, 'Colinet-Caplan syndrome'. Clerens showed the chest X-ray of the first patient with a typical 'Caplan' pattern. Also, he provided more information on the patients' jobs: they were packaging scouring powder. It is likely that they worked in the Vim scouring powder factory near the Saint-Pierre Hospital. This seems to be confirmed by a report from the internal medicine department of the same hospital, from January 1953, of a 41-year-old woman – a Vim scouring powder worker – with fatal 'acute' silicosis. Colinet had already noted that several of the (female) coworkers of his first case had died from 'silico-tuberculosis'.

Although Colinet's name was soon dropped from the syndrome's eponym, his early reports highlight the extent to which women in this industry were struck by occupational diseases and underscore that the RA association is not limited to coal worker's pneumoconiosis, the general understanding of Caplan's syndrome. Regrettably, more reports on autoimmune disorders in scouring powder workers would follow.

Women and girls in mine labour: from Italy to South Africa

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"How can we know what happened in the past? We cannot travel back in time, ask the people who were alive long ago. Historians use evidence that survives from the past. Like detectives, they search for clues. They piece together what they think the past was like." (McGregor Museum, Kimberley, South Africa)

Searching for evidence on women in male-dominated work is hard to find, yet the hidden path of women and girls forced into mine labour in Italy, from the beginning of the nineteenth century, was discussed in this paper.

In Italy, women were forced into carrying the ore out of slate quarries (slate contained 25% of silica) (Meeting of Italian Scientists in Genoa, 1846); selecting lead and zinc minerals in Montevecchio mines (Sardinia), where in 1871 eight girls (10–15 years old) and three women died due to the fall of a wall (Peis Concas I, 2010); and going down sulphur mines for twelve and fourteen hours, sometimes during the night (Jessie White Mario, 1894). At that time, Sicily was a British trading colony (Kutney, 2007) and the 'track system' was imported, although it had been forbidden in England since 1834. *"Sulphur mine industry occupies many thousands of workers of every sex and age… hundreds and hundreds of boys and girls go down on steep ladders along paths carved in wet ground at risk of landslide"* (Villari P, Letters from the South, 1875).

Montessori, one of the first Italian women medical doctors, attended the London International Council of Women in 1899 to ask for the prohibition of women and children under the age of 14 years from working in sulphur and other mines (ICW Proceedings, London 1899), inspired by the Factory Acts. In 1902, Italy finally had its first law on limiting women and child labour. A discussion of women in South African copper mines, and the data on silicosis among women, concluded the paper's path.

A history of agricultural health and safety

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The first milestone in the history of agricultural worker health and safety was the work of the Swedish archbishop, Olaus Magnus. He recognised in his *Historia de Gentibus Septentrionalibus* (1555) that grain threshers damaged their lungs by exposure to grain dust. The father of occupational medicine, Bernadino Ramazzini, generalised this observation in his seminal work, *De Morbis Artificum Diatriba* (1700), to recognising that particles in a variety of occupations were dangerous to breath. These could be dusts from animal, vegetable, or mineral sources. He particularly recognised the respiratory hazards to millers, grain sifters, horseback riders, and tobacco workers. Ramazzini noted that farmers were at high risk of pleurisy, pneumonia, and asthma, mainly due to exposure to *"the inclemency of the weather"*. In England, the Threshing Machines Act of 1878 focused on the mechanical hazards of agriculture, but the hazards of agricultural work were largely ignored as the industrial revolution focused on the dangers of mining and manufacturing. In 1939, John Powers wrote that *"During the past quarter century the hazards of industry, transportation, mining and construction have been recognized. For agriculture…there has been no such recognition, and farming, thought the oldest occupation in the world, remains the most hazardous"*. That focus changed in the 1950s with the creation of the National Institute for Farm Safety in the US, and in the UK the Agriculture (Poisonous Substances) Act (1952), and the Agriculture Safety, Health and Welfare Act (1956). The Occupational Safety and Health Administration (OSHA) Act in the US (1970) largely ignored the agricultural workplace until 1991, when the National Institute for Occupational Safety and Health (NIOSH) was funded to create a farm health and safety programme. The recent years have recognised the reality that agricultural work is now largely and increasingly done by immigrant workers, and efforts by government, academia and non-governmental organisations have focused on this vulnerable population.

Thomas slag pneumonia

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In 1878, the Bessemer process for steel production was modified by adding limestone to the process in order to remove phosphorous. A by-product of alkaline slag, 'Thomas slag', was generated, which could be used as a fertiliser. In Germany, it was noticed already in 1887 that workers processing the Thomas slag had a high prevalence of infectious pneumonia. In 1888, a drastic increase of deaths from lobar pneumonia, which mainly affected men in working age, was noted in an English county. The workmen themselves attributed it to inhalation of dust from a newly opened industry that was grinding and sifting alkaline slag from the Thomas process. A report from the Local County Council concluded that exposure to 'slag dust' was not the primary cause, but could be a contributing cause. In 1889, a German report concluded that workers processing Thomas slag fell ill with severe croupous pneumonia that was probably caused by pneumococci in combination with inhalation of the dust from the Thomas slag.

A German doctoral dissertation from 1890 described an epidemic of pneumonia among workers in Thomas slag mills, with high mortality in this new fertiliser-production industry. The mills were so dusty that workers two metres apart could not see each other. The content of the slag was phosphate, lime, silica, iron oxides, and manganese compounds. The thesis also presented a pathologic section from a deceased worker, noting copious slag particles in the lung. It was explicitly stated that there were no pneumococci in the lungs. The thesis concluded that this was a pneumonia caused by inhalation of the Thomas slag that, due to its etching properties, injured the lungs. In 1909, the German Government issued rules for the workplace conditions in Thomas slag mills, but occurrence of severe, often fatal, illness remained high. From 1929, pneumonia among workers processing Thomas slag was listed in Germany as an occupational disease.

The early investigators attributed the increased susceptibility to pneumococcal infections to the irritating properties of the alkaline lime; manganese was not mentioned as a possible etiologic factor. German researchers continued to describe case series of severe pneumonia among workers processing Thomas slag. Despite this rich early history continuing well into the 20th century, over the last 50 years the condition has been largely forgotten. Modern investigational techniques have not been applied to understand more fully the mechanisms underlying Thomas slag pneumonia.

Historical response to environmental disasters in the United States: a review of governmental intervention

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In the aftermath of the 9/11 attacks resulting in the collapse of the World Trade Center, responders and workers in the impacted area developed a myriad of diseases, including cancer. Treatment is now covered by government-funded programmes, but these treatment programmes started only after extensive lobbying by sick workers and healthcare advocates. This calls into question government's handling of worker protection and communication of air quality results following the disaster. This presentation looked at several environmental disasters in the history of the United States, and compared the governmental response to protect workers at these disasters. We reviewed the response to radiation exposure at the Nevada Test Site, Asbestos exposure in Libby, Montana, and Silica exposure in Hawks Nest Tunnel, West Virginia. History has shown that the time it takes to institute coverage following evidence of exposure-related illnesses is prolonged, often resulting in needless morbidity and mortality. Study of the history of response to environmental disasters can improve the protection and health of workers involved in future events.

Poster presentations

History of occupational health and safety laws in Ghana

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The development of occupational health and safety (OHS) laws in Ghana has been driven mainly by developmental and historical antecedents in the mining industry. Health and safety concerns first gained prominence following agitations among the indigenous labourers from the northern territory in the (then) Gold Coast. The labourers complained of high rates of morbidities and mortalities from tuberculosis and injuries as a result of poor sanitation, housing, and workplace air quality in the mines. The series of protests and worker agitations led to the first occupational mortality audit in the mines and the subsequent passage of several mining health legislations, including the Mining Health Ordinance to address mining area sanitation, housing, and worker health issues. Since 1925, when the first mining health ordinance was passed, several other laws have been promulgated. In fact, health and safety is a right guaranteed to all according to the 1992 Constitution of Ghana.

The three main statutes that have informed implementation of OHS in Ghana post-independence are the Labour Act 651 (2003), the Factories, Offices and Shops Act 328 (1970), and the Workman's Compensation Law PNDC Law 187 (1987). Others include: International Labour Organization (ILO) Radiation Protection, 1960 (No.115), ratified in 1961; Mining Regulations LI 665 (1970); EPA Act 490 (1994); Ghana Health Service and Teaching Hospital Act 525 (1996); Atomic Energy Commission Act 588 (2000); Public Health Act 851 (2012); and the Petroleum Commission Oil and Gas OHS policy: LI 2258 (2015).

Although there are legal instruments regulating most of the workplaces, these laws are fragmented. Moreover, the absence of a national policy on OHS in Ghana prevents the proper regulation of the occupational health space in Ghana. A draft bill of the OHS national policy is yet to be enacted into law.

History of disease exposure in school-aged children working in artisanal mines in North Kivu in the Democratic Republic of Congo

Kabemba Lukusamph JP

Volunteers for the Conservation of Fauna and Flora

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Artisanal mining is one of the main sources of income in Rubaya, DR Congo. In the squares of open land amidst the verdant vegetation of the territory of Masisi, in North Kivu, we do not see powerful excavators, but simply shovels, pickaxes, and muscular arms to handle them. Carriers, more or less solidly built, replace the trucks. They evacuate the ore via the small paths gullied by the torrential downpours that fall on the region during the rainy season. In Rubaya, 45 km from Goma, a dozen open-pit mining squares exploit niobium, cassiterite, and coltan (colombo-tantalite). Around the gutted earth, transformed into a mud pit at the slightest rain, young people of school age work: digging, washing minerals, sorting, transporting, etc. Judging by the grimacing faces of the young people who work tirelessly, all the tasks seem exhausting. These ores will be used in particular for the manufacture of capacitors, present in all electronic products. Demand does not seem about to decrease, as the new digital economy is greedy for it. In 2011, the Congolese Government submitted a national action plan to the International Labour Organization (ILO) to end child labour in the mines. In particular, it planned to *"make known and apply the legislation relating to child labour"*, *"make technical and professional training accessible"*, and *"give access to an education programme for children removed from work"*. It also commited *"to improve the living conditions of vulnerable households"*, so that socioeconomic vulnerability does not push families to make their children work. The programme was ambitious, but it never passed the milestone of official adoption. The children working are exposed to neglected tropical diseases, tuberculosis, respiratory tract infections, HIV/AIDS, and viral hepatitis B. There is also a major risk of the diseases being spread in communities and increases in mortality rates of school-age children.

SASOM:1948 to date

Kocks DJ

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On 8 October 1947, the first South African Society of Industrial Health was established. The Constitution has been in existence since July 1948 as a group within the Medical Association of South Africa (MASA), presently known as the South African Medical Association (SAMA).

Since then (and still applicable today), the standards of moral or ethical decision making are:

1. The workman must retain the right to choose his own doctor and that it would be incumbent on the factory medical officer to retain any fees so earned by him, and
2. The Society will not at any time enter into discussion or negotiations with any other individuals or organisations regarding remuneration for services rendered by its members.

At the annual general meeting (AGM) in 1951, the 'Rules in the case of part-time and full-time medical appointments to factories and similar industrial organisations' were formulated. At the 1958 AGM, it was agreed to open membership to all members of the Medical Association of South Africa who have occupational health interests.

The name changed in September 1957 to the South African Society of Occupational Health. The Society was renamed again, in August 1985, to the South African Society of Occupational Medicine (SASOM) – as it is known today.

SASOM successfully initiated the *Occupational Health Southern Africa* journal (OHSA) in 1995, achieved recognition of occupational medicine as a separate medical specialty in 2005, and hosted the International Commission on Occupational Health (ICOH) 29th Triennial International Congress on Occupational Health in Cape Town in March 2009.

Current interfaces in South Africa are with NIOH, SASOHN, SAIOH, MMPA, SASTM, OTOH, Universities, FCPHM (Occ. Med) SA, HPCSA, COHSASA, Department of Employment and Labour (DoELForum), and *Occupational Health Southern Africa* journal (OHSA). International liaison and collaboration include ICOH, Occupational Health in the Chemical Industry (MEDICHEM), and the International Occupational Medicine Society Collaborative (IOMSC).

The history of electronic waste at Agbogbloshie, Accra, Ghana

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Agbogbloshie e-waste site in Accra has existed for nearly 27 years, with a current workforce of ~4 500–6 000 workers, often untrained individuals who learn the trade on the job. This site started as a scrap market where various services such as vehicle repair, spare parts trading, welding, auto mechanics, and tyre servicing were rendered to support operations of trucks supplying foodstuffs to the yam market on the edge of the Korle Lagoon. This scrap market expanded and transitioned into an informal e-waste recycling hub, as many young males from the northern sector of Ghana, escaping the intertribal conflicts and unfavourable agricultural conditions, as well as seeking better livelihoods in Accra, enrolled for this job.

Rapid growth in informal electronic waste recycling activities (delivery and receipt, sorting, manual dismantling, and open burning) at Agbogbloshie, has been propelled by a lack of stringent enforcement policies and cost-effective technologies to manage e-waste recovery/recycling properly. Usage of rudimentary techniques in recovering valuable materials and associated pollutant emissions have not changed much, even after the passage of the Hazardous and Electronic Waste Control and Management Bill in 2016. Pollutants emitted, especially from the black plumes observed from the open e-waste burning, are destructive to the environment and resources. Worker exposures to these hazardous working conditions, and pollutants in various environmental media at the site, predispose them to several health effects. Exposures among e-waste workers over the years have been assessed mainly through cross-sectional studies. These have estimated trace metals and organic pollutant concentrations in environmental (soil, air, fish, sediment, water) and biological (blood, serum, urine, hair) samples. Worker health studies have reported increased risk of respiratory symptoms and lung function decline among workers.

Findings from these studies have been useful in implementing health promotion campaigns and have also encouraged stakeholders to build a wire-stripping workshop, a clinic post, and a technical training support centre for the e-waste workers.

History of occupational health in the Philippines

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In the Philippines, efforts to promote occupational safety and health were already evident during the American period, with the institution of the Employer's Liability Act No. 1874. The Act directed employers to compensate the family of a deceased worker whose death was caused by workplace conditions, or by the neglect of employers in the execution of their duty to protect the safety and health of their employees. There are other subsequent legislations aimed at providing occupational health and safety. The Workmen's Compensation Act, through Act No. 3428 of 10 December 1927, required compensation not only for death but also for illnesses and injuries caused by workplace exposures. Commonwealth Act No. 104 (29 October 1936), called the Industrial Safety Law, enforced certain rules and standards for the mining industry. Republic Act No. 1054, or the Free Emergency Medical and Dental Treatment Act (12 June 1954), stipulated the need for emergency dental services to employees. In 1903, physicians began to be employed in industries to provide medical treatment for sick and injured workers. During 1923–1932, the Section of Industrial Hygiene was established under the (then) Bureau of Health. This was followed by the implementation of the Workers' Compensation Act No. 3428 and the Emergency Dental and Medical Service Act No. 1054. After World War II, the Philippine Association of Occupational Medicine (now PCOM) was formed (www.doh.gov.ph). In 1950, the Joint International Labour Organization-World Health Organization (ILO-WHO) Committee on Industrial Hygiene issued its first international definition of occupational health. Finally, the history of occupational health and safety started with the functions and structure of the Department of Health (DOH). By virtue of E.O. 119, the DOH Office of Public Health Service was created, which had the Non-Communicable Disease Control Service tasked with the responsibility of formulating policies, programmes, and standards primarily for the prevention and control of occupational health, cardiovascular diseases, and cancer.

History of occupational contact dermatitis among paint workers

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Background: Paints are chemical products, which consist of resins, additives, solvents, and pigments. Exposure to paints can cause occupational contact dermatitis (OCD), which affects workers' productivity and working performance.

Objective: To describe the history of paints and OCD among paint workers.

Methodology: A retrospective cohort study was conducted; data were obtained from a literature review based on the occupational history of paint and OCD among paint workers, from ancient times to present.

Results: During the 1700s, paint production began in Europe and the United States. Further production demands arose after the Second World War. Paint composition has changed over time; currently, solvent-based paints have been replaced with water-based paints, which require more preservatives than the predecessors and, thus, increase risk of OCD in paint workers. In the 1960s, benzisothiazolinone (BIT) was introduced in the paint industry as a preservative, which resulted in an OCD case of two paint workers. A report was published in 1976, and BIT was identified by the Danish as an important allergen to painters. In the 1980s, isothiazolinone preservative and its derivatives (methylchloroisothiazolinone (MCI), methylisothiazolinone (MI), BIT, and octylisothiazolinone (OIT)) were highly used and OCD cases increased. Also in 1982, the first two medical cases due to OIT usage among workers were published. In the early 2000s, MI was introduced as a preservative in industrial products, where the first cases of OCD due to exposure were reported by Isaksson. In 2013 MI was named as 'Contact Allergen of the Year' by the American Contact Dermatitis Society. Exposure to MCI/MI had increased, by more than six times, the OCD cases among workers from 2008 to 2015. Due to contact with different allergens and irritants, paint workers were at risk. In the United States, an estimated 13 million workers are exposed to chemicals each year and are at risk of developing OCD.

Conclusion: Excessive usage of chemicals in the paint industry has increased OCD cases among paint workers throughout history.

Occupational Health Southern Africa – a brief history

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Occupational Health Southern Africa is the only accredited occupational health journal in the region. It was founded in 1995 by the South African Society for Occupational Medicine (SASOM) and the South African Society for Occupational Health Nursing Practitioners (SASOHN), and was later joined by the Southern African Institute for Occupational Hygiene (SAIOH) and the Mine Medical Professionals Association (MMPA). The journal provides a platform for scholarly engagement through the publication of peer-reviewed research articles, opinions, reports, news, and related matters.

In 2004, the journal was accredited by the South African Department of Higher Education and Training and, in 2011, it was added to the SABINET African Journals online platform to enhance its accessibility and visibility. It is also listed on African Index Medicus. In 2017, the manuscript submission and review processes moved to an online platform. The COVID-19 pandemic necessitated a switch from print to digital publishing in 2019, which also prompted the overhaul of the website to make it more appealing, and comparable to top international scientific journal websites. That same year, an Editorial Advisory Panel, which includes international occupational health experts, was constituted to augment the expertise of the Editorial Board, which is constitutionally comprised of representatives of the stakeholder occupational health societies.

Over the years, the Editorial Board, Advisory Panel, and publisher have worked to transform the original magazine-type publication into a respected scientific journal. The journal conforms to the policies, procedures, and guidelines of the Committee on Publication Ethics (COPE) and the International Committee of Medical Journal Editors (ICMJE), to promote best practices in publishing. Despite the small team, 169 issues have been published to date, all of which are on the website www.occhealth.co.za. Efforts are underway to apply for international accreditation and to increase *Occupational Health Southern Africa*'s footprint on the African continent.

Effect of mining-related air pollution on human health from 2000 to 2018: the case of Zambia

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Zambia's economy has largely been mining dependent, with the copper industry dominating for more than eight decades. Increasing global demand for copper, combined with the liberalised local economic policies pursued since the early 1990s, has seen the industry grow as old mines were revived and new ones opened. Despite the greater economic opportunities the industry offers the country, mining has attendant risks such environmental and health risks. We examined the air pollution and respiratory health risks related to mining activities in the main mining area of Zambia, the Copperbelt, from 2000 to 2018.

Sulphur Dioxide (SO_2) and particulate matter of aero-dynamic size PM10 and PM2.5 were predominant ambient pollutants from the mining operations over the years. Main sources of pollutants were flue gases from smelter operations, and dusts from within the mines and blown from abandoned waste rock. Emissions of PM10 amounted to 406.8 kilotonnes/year (kt/yr) and this accounted for 35% of the total emissions. Similarly, SO_2 emission of 346.7 kt/yr were reported. The mines' operations contribute over 98% of the country's SO_2 emissions. Recent investments in mining activities are expected to yield even increased SO_2 emissions because of several new copper smelters. SO_2 and PM emissions for most of the five large-scale mines, with smelters and other licensed dischargers, were above national set limits by 111–155% (the Zambia Environmental Management Agency standards). Most residential areas in mining towns lie directly within the affected vicinity of the smelters. Generally, studies reported that for an increase of 10 µg/m^3, the daily number of admissions of asthma in children increased by 1.3% (95% CI 0.4 to 2.2%), while an increase in PM10 level by 10 µg/m^3 was associated with 1.27%, 1.45%, and 2.00% increase in hospital admissions for heart disease, chronic obstructive pulmonary disease, and pneumonia, respectively.

Anecdotes of medical philosophy 300 years ago from Ramazzini

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Bernardino Ramazzini lived and worked in Modena and Padua, Italy, around the turn of the 16th century. He published a collection of his orations and notes in 1710, called *The Health of Princes*. The book deals with public health in respect of the lifestyle, environment, and medical treatment of both simple country folk and nobility.

The presentation analysed Ramazzini's writings and observations about fevers, health in general, and lifestyle in Italy 300 years ago, with a discussion of the medical treatments provided.

Ramazzini was fond of relating medical anecdotes and theories. He published extensively, so much so that his publisher grew weary of his prescientific writing, saying the doctors wanted to read about clinical guidance rather than 'theories'. As a result, Ramazzini had to pay for the publication of the last chapter of *The Health of Princes* himself.

Ramazzini had strong opinions on the common bloodletting practice of the time; unlike many of his colleagues, he was not in favour of this as a panacea. He relates his treatment success in the section *Epidemic Constitutions of Modena* over a five-year period (1690), where the patient – a poor farmer – was suffering from a 'double tertian fever' with parotitis, and how *"without taking any other kind of remedy, his good health was restored by drinking abundant wine"*.

The possible medical background and mechanism of the treatment used in this case, among others, was discussed. The presentation compared the medical thought and practice in Ramazzini's day with today, and distilled from the book some guiding principles still relevant for current public health.

The rise of the occupational hygiene profession in Norway

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The title 'occupational hygienist' first came into use in Norway in the 1970s, starting with the Norwegian Labour Inspectorate employing academics with a chemical or physical background, and training them in the field of occupational hygiene. Part of the training was conducted in Sweden. Before, the term 'occupational hygiene' mainly was used in Norway to describe the field of preventive occupational medicine.

The first occupational hygienist in Norway recognised by the Norwegian Occupational Hygiene Association was Karl Wülfert. He came to Norway in 1928, after he had finished his PhD at the University of Munich (Germany) and had worked for a year in Sweden with the later Nobel Prize Winner in Chemistry, Prof. H von Euler-Chelpin. From 1931, he was involved in building up the new fish canning laboratory in Stavanger. In 1947, he became chief chemist at the new Laboratory for Chemical Analysis and Assessment of Exposure in Norwegian Working Life in Oslo. This laboratory was the precursor of what later become our National Institute of Occupational Health. In 1977, we got the modern Worker Protection Law, the same year the first academic position in occupational hygiene was established at the Norwegian Technical University (NTH) in Trondheim. Our first professor was Egil M. Ophus. The year after, we got our first occupational exposure limit (OEL)V list.

The Norwegian Occupational Hygiene Association was established in 1985. By 2022, the Association had grown to approximately 380 members. The number has been stable over the last 10–15 years. The density of occupational hygienists in Norway, based on the number of members of the Association, is approximately 8 500 workers per occupational hygienist. This places Norway among the top countries in the world; however, the numbers are still considered to be too low to ensure sufficient protection of the workers.

RMA's Prevention Programme – Prevent | Protect | Prosper

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Background

In April 2022, Rand Mutual Assurance (RMA) launched the Prevention Programme, which is a strategic focus area of the business. RMA administers claims for occupational injuries and diseases according to the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 (COIDA). RMA has the licence to administer claims for both the mining and metals-related industries.

As an organisation that has existed for 129 years, there is a large amount of data available to us that informed the decision to launch the Prevention Programme. The programme is offered to our metals class employers as our statistics indicate that this class, compared to mining, has a higher number of injuries; therefore, interventions are needed to curb these. The Prevention Programme aims to assist our metals class members with improved safety, health, and wellness initiatives. Prevention is all encompassing of these important business imperatives. We believe that a safer workplace can result in safer work practices and therefore we offer our members a better opportunity for enhanced production and quality of goods. RMA understands the impact of poor working conditions and environments, and how these contribute to workplace fatalities, injuries, and diseases.

Reflecting on the effectiveness and initiatives of the programme

Since inception, the Prevention Programme has grown steadily, with a remarkable increase in the sign up of employers in 2023 from 2022. In 2022, 10 companies joined the programme and, by the end of 2023, an additional 17 companies had joined. The 27 companies that are now part of the programme range from small family-run businesses to large heavy-steel industries, including companies that manufacture vehicles and parts in the automotive sector. The increase in interest is attributed to the promotion of the programme; results are evident in the companies that joined in 2022. The growth is also attributed to companies that are battling to implement their own prevention programmes due to limited funding and resources.

In 2023, the Prevention Programme implemented several activities, which resulted in an increased uptake of members to the programme, improved safety performance of employers, and greater collaboration with our stakeholders.

Examples of some of these interventions include: solutions to close out safety audit findings, training, awareness, and medical



RMA's Prevention Programme seeks to curb the high rate of injuries in its metals class of companies
Photograph: cookie_studio on Freepik

surveillance. Of the solutions implemented, most have included occupational hygiene surveys, employees undergoing medicals, correct and appropriate personal protective equipment, and additional safety support.

In terms of advocacy, RMA hosted its first Prevention Conference, which was well received and brought the metals industry together. This was an expected outcome as a general finding identified during the gap analyses was that many health and safety professionals had not been given opportunities for continuous professional development, or to keep up to date with the legislative environment and best practices. RMA also introduced the launch of prevention days which encompass health, safety, and wellness activities to create a culture around prevention and to empower employees to know their basic health statuses.

Stakeholders and partners are vital for the success of the Prevention Programme. One important stakeholder for RMA and the metals industry is the National Union of Metalworkers of South Africa (NUMSA). RMA has committed to training approximately 3 000 shop stewards in a three-day basic health and safety course. The course will help to advance education and awareness for union members to fulfil their mandates, a major one of which is health and safety.

Plans for 2024

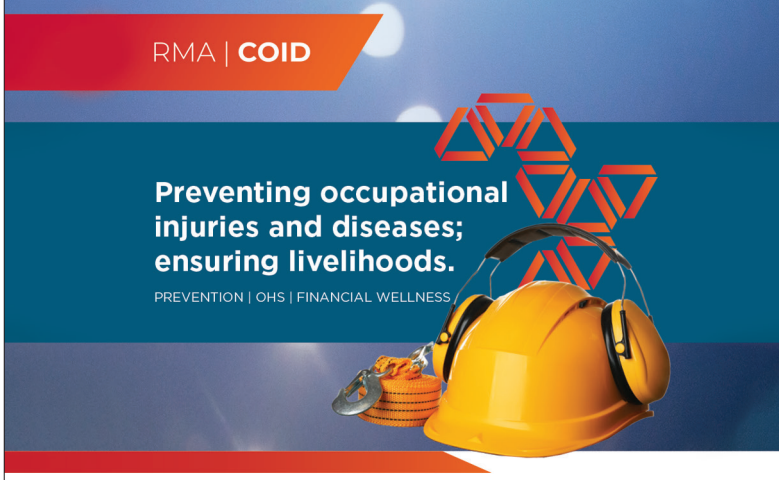
In 2024, the Prevention Programme will mobilise its execution of delivering prevention initiatives in the RMA members' workplaces to reduce the rates of incidents and ultimately reduce the number of claims. This will also foster a culture where prevention is seen as an important business imperative. An exciting event will be the launch of the first RMA Prevention Awards, which will recognise top talent in the metals space, aligned to prevention campaigns, innovations, teams, and employees who are advocates of prevention. The aim of these awards is not only to recognise and acknowledge such talent, but also to generate pride, excitement, and morale around prevention. In an industry such as the metals space, where prevention is not well entrenched, we anticipate that this event will ignite the need to refocus on safe production.

Another activity planned for 2024 is the inclusion of a wellness element in the programme. The aim is to assist employees working in companies that do not have the most basic of psycho-social support to obtain this through an employee assistance programme. Prevention is a dual responsibility and, whilst the programme continues to work in parallel with the employers, there is a need to recognise that psycho-social factors truly have a bearing on safe performance.

Reflecting on the work done this year, RMA is proud to state that it is a social insurer that aims to serve with compassion and care. The Prevention Programme is doing just this. Our aim is to prevent occupational injuries and diseases, protect both the sustainability of organisations and their employees, and allow for both employers and employees to prosper. Sustainability is critical to making a real difference and, in 2024, we aim for continuous improvement, the inculcation of prevention as a key business imperative and, ultimately, to carry out our purpose, which is for our members' employees to return home healthy and safe every day.

If you have any questions about the Prevention Programme and how we can work closely with you, please contact our team at rmaprevention@randmutual.co.za

RMA | COID



PP

Our PREVENTION PROGRAMME
is a blend of Occupational Health and Safety (OHS) and financial wellness solutions developed in line with leading Occupational Health and Safety (OHS) and Financial Wellness standards.

The programme is designed to complement existing employer safety programmes and enhance the drive toward the overall physical and financial wellness of employees within our Class Metals (Iron, Steel, Artificial Limbs, Galvanising, Garages, Metals, etc.) client base.

Ultimately, a reduced incident rate ensures healthy and stable families.

Taking care of lives **since 1894**

For more information, contact us:

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Southern Africa Tuberculosis and Systems Support Project: a multi-disciplinary and multi-sectoral approach to addressing TB and occupational lung diseases in southern Africa

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BACKGROUND

The Southern African Tuberculosis and Health Systems Support (SATBHSS) project was launched with the primary aim of strengthening the health sector's response to tuberculosis (TB) and occupational lung diseases (OLDs) in Lesotho, Malawi, Mozambique, and Zambia. Its key strategic objectives were premised on 1) improving coverage and quality of key TB control and OLD services in targeted geographic areas of the participating countries, and 2) strengthening regional capacity to manage the burden of TB and OLDs. Now at the end of its life cycle, the SATBHSS project has added immense value to the project countries' TB and OLD programmes. The project concludes with the achievement of critical systems improvement, the creation of a critical mass of experts, and substantial institutional and knowledge capital across the participating countries. This is evidenced by, among other things, improved diagnosis of TB and OLDs, ratification of pertinent occupational safety and health-related International Labour Organization (ILO) conventions, and development of national occupational health services frameworks in the project countries; it has resulted in some exclusive and important achievements and lessons. The project drastically improved several corporate, environmental, and occupational procedures to protect workers, communities, the environment, and businesses.

IMPLEMENTATION METHODOLOGY

The SATBHSS project sought to 1) implement innovative prevention, detection, and treatment of TB, 2) improve regional capacity for disease surveillance, diagnostics, and management of TB and OLDs, and 3) improve operational research and knowledge sharing regarding TB and OLDs.

The SATBHSS project was implemented as an innovative and intelligent strategy, premised on the creation of sustainable systems and programmes that would outlive the project. To this effect, the African Union Development Agency-New Partnership for Africa's Development (AUDA-NEPAD) took a participatory approach, spearheaded by the project countries under its technical guidance. The fundamental principles of the project were to create a critical mass of in-country experts, create a robust institutional memory about TB and OLDs, and improve mine inspections for silica dust control.

RESULTS

The SATHBSS project has been a game changer in the region, concerning occupational health services, TB management, and mine health inspections. Several remarkable improvements at both country and regional levels have been achieved to date.

Regional centre of excellence on occupational health and safety

The project superintended the establishment of a regional centre of excellence on occupational health and safety (CoE-OHS) located in Kitwe, Zambia. The centre has trained more than 2 000 officials in occupational health and safety, particularly in OLDs and occupational hygiene – activities that are the fundamental to primary prevention interventions. Under the project, the CoE-OHS, supported by the AUDA-NEPAD, developed and implemented a five-year strategic plan, and also developed the centre's monitoring and evaluation plans. The centre recently completed a sustainability plan, which has not yet been fully implemented and needs further support.

The project is playing a critical role in establishing the African Union Occupational Safety and Health Information System (AU-OSHIS), which is in its advanced stages. This system is a public good, and owned by member states, meaning that they control the data generated. The system is linked to the District Health Information System/Software 2 (DHIS2) and is already available in more than 53 AU member states. However, given the remaining implementation period, it is unlikely that a comprehensive implementation and scaling up will be achieved.

After the completion of the regional baseline study, several recommendations for occupational safety and health policy reforms were followed up. Consequently, several developments were realised, including 1) occupational safety and health policies developed in Lesotho, Malawi, and Zambia, 2) the ratification of several ILO instruments in the form of ILO conventions, and 3) Malawi's promulgation of the Mines and Minerals Act of 2019. More critical occupational health and safety (OHS) laws are under review, where member states require further technical support and regional harmonisations to ensure that laws align with international best practices.

Human capacity development and training

Through the CoE-OHS project under AUDA-NEPAD, the ILO International Classification of Radiographs of Pneumoconiosis (ILO-ICRP) training curriculum was developed. More than 300 medical doctors and radiologists from the project countries and beyond were trained. The curriculum has proven to be an excellent regional tool that needs to be anchored in AUDA-NEPAD, and the CoE-OHS and AU systems. The countries that participated realised several OLDs improvements, such as increased diagnosis and treatment of TB and management of silicosis among miners, improved diagnosis and management of TB among mining communities and ex-mine workers, and an increase in the number of compensated ex-miners who worked in South Africa, particularly in Lesotho, Eswatini, Mozambique, Malawi, and South Africa.

Under the project, a private sector engagement in TB control survey was conducted, which led to the development of the regional private sector engagement strategy in TB control, roadmaps and implementation, and monitoring and evaluation plans. The private sector engagement in TB strategy has been implemented in four southern African countries and has increased the number of private healthcare providers that screen, test, and treat TB patients. The project also contributed to contact tracing and finding missing TB cases among miners, ex-miners, and their families. Countries also introduced innovations such as the use of a DHIS2-based application for tracking TB patients in the private sector – from screening to treatment completion; incentivising private health facilities to provide TB services at low cost; a contact tracing systems for index cases identified in the private sector; integrating TB into regulatory bodies' private health facilities assessment tools as well as scaling up traditional healers' screening and referral of presumptive TB cases. This work inspired the development of the AU Private Sector Engagement (PSE) in Health Framework. The AUDA-NEPAD is responsible for implementing the PSE in Health and the Regional Health Financing Hubs of the Africa Leadership Meeting (ALM).

CONCLUSION

As the project draws to a close, there is a need to sustain the initial investments carried by member states and the World Bank in TB and occupational health and safety, including private sector engagement and financial investment in health. The AUDA-NEPAD, under the Human Capital and Institutional Development (HCID) directorate, should consider establishing an occupational health and safety programme to support member states in scaling up OHS initiatives and harmonising and developing the capacity of government OHS officials.

ACKNOWLEDGEMENTS

The World Bank funds the SATBHSS project: P155658 and P173228. For more information, visit www.satbhss.org and www.nepad.org. AUDA-NEPAD acknowledges the World Bank, the project countries (Lesotho, Malawi, Mozambique, and Zambia), and partners.

UPCOMING EVENTS

OCCUPATIONALhealth
SOUTHERN AFRICA

INTERNATIONAL

34th ICOH International Congress
Marrakesh, Morocco
28 April - 30 May 2024
Website: https://www.occhealth.co.za/pdf/ICOH2024FirstAnnouncement.pdf

8th World Conference on Research Integrity
MAICC, Athens, Greece
2-5 June 2024
Website: https://wcri2024.org/
Registration: https://wcri2024.org/registration-fees/

Go to
www.occhealth.co.za
'Upcoming Events'

to see upcoming local and international OH events

Clinsys

Occupational & Primary Health

New - Covid-19 Module



Primary Health Care Acute Diagnosis Report showing most frequent diagnoses

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News from the SASOM National Office

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SASOM Annual Congress 2023: a virtual event in four sessions

Following the success and good attendance at the Annual Congress in 2022, which was held in a fully digital format in four sessions across four months, the 2023 Annual Congress of the South African Society of Occupational Medicine (SASOM) was held in the same format. The theme was *Occupational health practice in 2023: shining a light on the shadows of medicine,* and comprised four sessions on the last Friday of the months of June, July, August, and September 2023. Each session was CPD-accredited for four CEUnits by the South African Medical Association (SAMA).

The sub-themes and presentations are listed below, per individual session:

Session 1, 30 June 2023: Good practice for occupational health medical practitioners (OHMPs)

- Ass. Prof. Jason Kai Wei Lee (National University of Singapore, and Chair of the International Commission on Occupational Health (ICOH) Scientific Committee on Thermal Factors) – 'Workers in a warming world: more than just heat injuries and productivity losses'
- Prof. Johan du Plessis (North-West University (NWU), and Southern African Institute for Occupational Hygiene (SAIOH)) – 'Additive manufacturing/'3D-printing': an emerging occupational health concern or not?'
- Michelle Bester (Tshwane University of Technology (TUT), South African Society of Occupational Health Nursing Practitioners (SASOHN), and Secretary of the ICOH Scientific Committee on Education and Training in Occupational Health) – 'The role of primary healthcare (PHC) in occupational health: primary identification, initial management and referral'
- Prof. Emeritus Carel Hulshof (University of Amsterdam, The Netherlands, and Secretary of the ICOH Scientific Committee on Effectiveness in Occupational Health Services) – 'The 'haves and have-nots': lessons from occupational health services in corporates, small- and medium-scale enterprises, and what about the informal sector?'

Session 2, 28 July 2023: Updates in legislation, compensation, and ethics in occupational health

- Dr Jan Lapere (Occupational Health Legal Advisor, and SASOM ExCo) – 'Legal accountabilities of the occupational service provider: wading through the changes in ethical rules for medical records and how these are impacted by the POPI Act'
- Elsabé Klinck (Managing Director: Elsabé Klinck and Associates, Johannesburg, South Africa) – 'Compensation and ethics of occupational diseases and return to work policies and strategies: the role of the DoEL and COIDA and how gaps can be addressed'
- Warren Mallon (Specialist: Occupational Hygiene and Health (Physical Stressors and OH AIAs), Department of Employment and Labour, South Africa) – 'Interrogating the updated regulations in South Africa'
- Dr Tshegofatso Mabelane (Allergologist: 'About Allergy', South Africa) – 'Occupational asthma and allergic contact dermatitis: a practical approach to managing two common occupational diseases'

Session 3, 25 August 2023: Emerging issues and hot topics in occupational health and medicine

- Dr Veruscka Leso (University of Naples Frederico II, Naples, Italy, and Secretary of the ICOH Scientific Committee on Toxicology of Metals) – 'Fast facts on nanotechnology: implications for occupational health and safety'
- Dr Amparo Benavent (OSH Unit of Healthcare, Regional Ministry of Valencia, Spain) – 'Nursing and hazardous drugs: a gender-based approach to the conditions and consequences of their use'
- Prof. Carolyn Marie Audet (Department of Health Policy and the Institute for Global Health, Vanderbilt University Medical Center, USA) and Dr Ryan Wagner (School of Public Health, University of the Witwatersrand, South Africa, and Senior Research Fellow, South African Medical Research Council/Wits Agincourt Research Unit) – 'Identifying and mitigating occupational health risks among traditional healers: an individually randomised controlled trial to improve personal protective equipment use among traditional healers in South Africa'

- Dr Max Lum (National Institute of Occupational Safety and Health (NIOSH), USA) – 'Algorithms, artificial intelligence, machine learning and the future of work'

Session 4, 29 September 2023: Ergonomics and psychosocial factors in the workplace

- Prof. Stavroula Leka (Universities of Lancaster and Nottingham, UK, ICOH Board member, Past Chair of the ICOH Scientific Committee on Work Organisation and Psychosocial Factors) – 'Psychosocial risk management and the promotion of health, safety and wellbeing in the future of work: guidance for occupational health medical practitioners (OHMPs)'
- Lyndsey Swart (Occupational Therapist: University of Pretoria, Occupational Therapy Association of South Africa (OTASA), Occupational Therapy in Occupational Health (OTOH), South Africa) – 'The Ergonomics Regulations and occupational health: synergising ergonomics risk assessment, medical surveillance and functional assessment of worker fitness'
- Dr Deepak Sharan (Consultant in Orthopaedic Surgery and Rehabilitation, Bangalore, India, and Chair of the ICOH Scientific Committee on Musculoskeletal Disorders) – 'New digital tools in the assessment and management of work-related musculoskeletal disorders'
- Claudina Nogueira (ICOH Vice President for Scientific Committees, and SASOM ExCo) – 'Update on the ICOH2024 Congress'

Statistics, regarding participants for all sessions (a total of 391), are shown in Table 1.

Table 1. Registrations, participants (391), and countries represented at the four sessions of the SASOM Annual Congress 2023

No. registrations	No. participants (attendance rate)	Countries represented by participants and presenters
Session 1, 30 June 2023 – Good practice for occupational health medical practitioners (OHMPs)		
161	100 (62%)	Botswana (3), Democratic Republic of the Congo (1), Eswatini (1), Lesotho (1), Mozambique (1), Namibia (5), Singapore (1 presenter), South Africa (85, including 2 presenters), The Netherlands (1 presenter), United States (1)
Session 2, 28 July 2023 – Updates in legislation, compensation, and ethics in occupational health		
166	110 (66%)	Angola (1), Botswana (4), Eswatini (2), Mozambique (1), Namibia (8), South Africa (94, including 4 presenters)
Session 3, 25 August 2023 – Emerging issues and hot topics in occupational health and medicine		
151	106 (71%)	Botswana (4), Eswatini (2), Italy (1 presenter), Mozambique (2), Namibia (4), South Africa (89, including 1 presenter), Spain (1 presenter), United States (2 presenters), Zambia (1)
Session 4, 29 September 2023 – Ergonomics and psychosocial factors in the workplace		
99	75 (76%)	Botswana (2), Eswatini (2), India (1 presenter), Mozambique (1), Namibia (2), South Africa (64, including 2 presenters), The Netherlands (1), United Kingdom (1 presenter), Zambia (1)



Image: courtesy of SASOM

Collaboration between PHASA and SASOM: re-imagining occupational health training

On 10 September, the Public Health Association of South Africa's (PHASA's) Occupational and Environmental Health (OEH) Special Interest Group (SIG), in partnership with SASOM, hosted a hybrid workshop titled 'Bridging the gap between academia and the workplace: re-imagining occupational health training – preparedness of the occupational medicine provider to enter the working world'. The workshop was facilitated by Dr Blanche Andrews (Stellenbosch University) and formed part of the programme of the annual PHASA conference, which was held at the Boardwalk Convention Centre, Gqeberha (Port Elizabeth), from 10 to 13 September 2023.

The 2023 conference theme was *Transforming research translation: re-imagining public health evidence, policies, and practice*. The workshop aimed to explore innovations for re-invigorating occupational medicine training in South Africa and bridging the gap between training and practice to ensure that graduates are equipped with skills relevant to the working population they serve. It further aimed to stimulate a discussion around innovative ideas to 'future-proof' occupational medicine training in South Africa. The workshop commenced with an introduction to set the scene, followed by a panel presentation by national and international occupational medicine experts directly involved in occupational medicine training. The workshop ended with a facilitated discussion and consensus on future actions.

The introduction highlighted the strategic importance of South African occupational medicine training to the African continent. South Africa is strategically positioned as it is the only southern African country that offers formal occupational medicine training, locally and to the rest of southern Africa. Training programmes allow two streams of qualification: a master's degree in occupational medicine (research-based or practical MMed specialist training) or a Postgraduate Diploma in Occupational Health/Medicine (PG Dip OH/OM).

The panel session commenced with a presentation by Ass. Prof. Shahieda Adams, occupational medicine specialist at Groote Schuur Hospital and the Division of Occupational Medicine, University of Cape Town. She is also Chair of the Division of Occupational Medicine in the College of Public Health Medicine, The Colleges of Medicine of South Africa (CMSA), for the triennium ending October 2023. Prof. Adams outlined the current South African specialist training landscape, highlighting the move to workplace-based assessments and entrustable professional activities. She noted that training challenges included resource constraints, limited training platforms, and practical training exposures (including the private sector). The presentation questioned the efficient use of technology in occupational medicine specialist training, including the 'Internet of Things' and artificial intelligence (AI).

Dr Fiona Kevitt, the National Specialty Director for the Faculty of Occupational Medicine (FOM), Royal College of Physicians of Ireland (RCPI), and the Clinical Lead for the RCPI/FOM Outcomes-based Education Curriculum Revision Project, presented the Irish training experience. Key caveats from her presentation included the emphasis on practical exposure through placements in various work environments within the training programme, and the move toward an outcomes-based education model. Dr Gordon Haire, a recently qualified occupational medicine specialist, shared his experience of moving from Ireland to Australia and applying his skills in a new environment. He noted that his training allowed him to comfortably use his skills in various contexts, including practising in a different country. He stressed the importance of mentorship and support for all new trainees, regardless of which country/jurisdiction they may have been trained in.

Dr Lanre Ogunyemi, the Immediate Past Chief Examiner for the Faculty of Occupational Medicine (FOM), United Kingdom (UK), Regional Speciality Adviser in occupational medicine for the Trent Region, and Deputy Chief Examiner for the Faculty of Occupational Medicine (FOM), Royal College of Physicians, Ireland, presented the UK perspective. Occupational medicine trainees in the UK can follow a formal or informal route to specialisation. The formal route involves a structured four-year programme. The key components of the 2022 revision of the occupational medicine curriculum were outlined. Learning outcomes included areas related to professionalism, research, clinical practice, workplace risk, worker safety, education and training, and leadership.

Dr Frederick Weinand, an occupational medicine specialist in the Ministry of Health, Tanzania, with international training completed in the UK and South Africa, presented the PG Dip OH/OM training. He compared the traditional in-person modular training structures to a hybrid approach to training, incorporating distance learning. Benefits of a hybrid training approach include continuous training and online support for the course duration, access to a diverse pool of lecturers, as the constraints associated with travelling and busy schedules are mitigated, and ring-fencing contact time for practical worksite visits and training. Dr Weinand presented future recommendations for the PG Dip OH/OM training, including agreed-upon learning competencies across diploma programmes for greater standardisation, centralised training and assessment through the CMSA, and collaboration across universities, including curriculum review. He also emphasised the need for international collaboration and an Occupational Medicine Centre of Excellence. He envisioned that this Centre of Excellence would accommodate South African and regional African training needs, establish a mentorship programme, and clearly delineate the scope of practice of occupational health nurse practitioners, occupational medicine practitioners, and occupational medicine specialists.

The introduction and panel presentation were insightful and thought provoking, and laid the foundation for a robust discussion. Due to time constraints, it was agreed by those in attendance that further stakeholder engagement was required to comprehensively plan for the future of occupational medicine training and practice in South Africa and the broader geographic region. A consolidated position statement incorporating the aims and consensus of the workshop was seen as a stepping-stone to begin the process of re-imagining and innovating the training of occupational medicine service providers.

A common, shared vision and unified action are needed. To quote an African proverb, *"If you want to go quickly, go alone. If you want to go far, go together"*. The innovative transformation of occupational medicine training will require all relevant stakeholders, including but not limited to academia, industry, and graduates, to collaborate in charting a way forward.

The Public Health Association of South Africa Occupational and Environmental Health Special Interest Group (PHASA OEH SIG) welcomes further comment on this topic:

• Dr Blanche Andrews, Division of Health Systems and Public Health, Stellenbosch University, e-mail: bandrews@sun.ac.za

• Dr Sujatha Hariparsad, Discipline of Occupational and Environmental Health, School of Nursing and Public Health, University of KwaZulu-Natal, e-mail: HariparsadS1@ukzn.ac.za

• Dr Itumeleng Ntatamala, Occupational Medicine Division, School of Public Health, University of Cape Town, e-mail: itumeleng.ntatamala@uct.ac.za

SASOM Western Cape Chapter webinar

The SASOM Western Cape Chapter organised a webinar on AI in healthcare on 10 October 2023, hosted by the SASOM National Office on its Zoom platform. Two presentations were delivered in the webinar:

• Ass. Prof. Mark Sujan (Chartered Ergonomist and Human Factors Specialist, University of Warwick, UK) – 'Deploying AI in healthcare environments: lessons learnt'

• Dr Muzzammil Ismail (Public Health Medicine Specialist, Western Cape Department of Health, South Africa) – 'AI-enabled occupational and public health: an important chat'

SASOM ExCo and Annual General Meetings – November 2023

SASOM held its last ExCo meeting of the year on 13 November 2023, fully virtually. Its annual general meeting (AGM) took place on 17 November 2023, as an associated meeting of the 7th International Conference on the History of Occupational and Environmental Health (organised by the ICOH Scientific Committee on History of Prevention of Occupational and Environmental Diseases), held in Durban, South Africa, from 15 to 17 November 2023. SASOM was represented on the organising committee of the conference, and members chaired sessions and delivered oral and poster presentations. SASOM took the opportunity to market ICOH at the conference and promote the benefits for occupational health practitioners in becoming ICOH members. To this end, SASOM designed a flyer with ICOH information for conference attendees, and hardcopies of ICOH membership forms were available for those interested in applying for ICOH membership. Feedback on the AGM and the history conference will be published in the SASOM newsletter of the first issue of *Occupational Health Southern Africa*, 2024.

Season's greetings

SASOM takes the opportunity of the festive season spirit to congratulate the Executive Director of the National Institute for Occupational Health (NIOH) in Johannesburg on being awarded an adjunct professorship by the University of the Witwatersrand, South Africa. Congratulations and many celebrations, Prof. Spo Kgalamono – Chair of Occupational Health, SASOM ExCo member, and long-time friend! SASOM is very proud of your academic achievements and valuable contributions to occupational health over many years!

The SASOM National Office will close for the end-of-year festive season on 14 December 2023, and re-open on 8 January 2024.

'Tis the season to be not only merry, but also grateful, mindful, hopeful, and reflective of the past year. SASOM wishes all its members, their families and friends, and their communities a peaceful, healthy, and safe festive season, filled with many blessings. May 2024 bring us all peace of mind, kind hearts, contented spirits, and many successes and rewards in all facets of life. SASOM will continue supporting its members in 'all-things-occupational-health-and-medicine' and is pleased to continue supporting *Occupational Health Southern Africa*, which it considers to be a rich regional resource in occupational health.

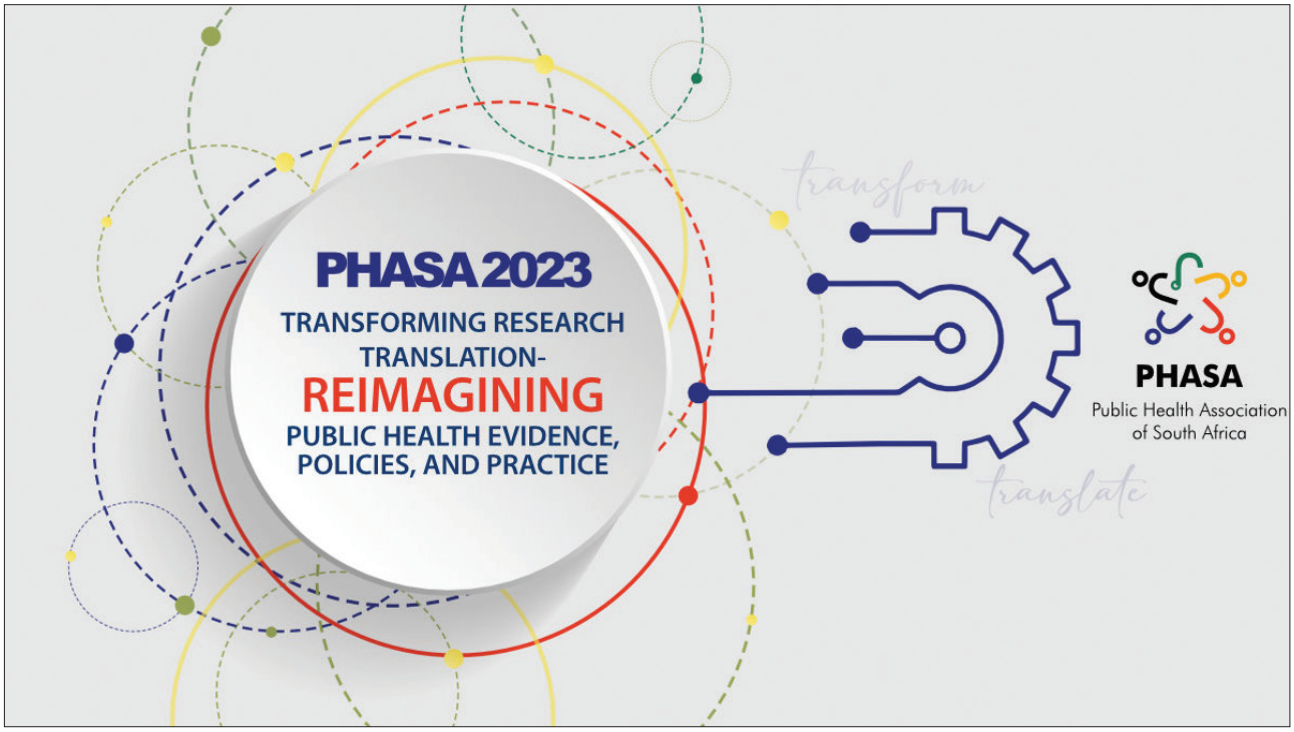


Image: courtesy of SASOM

SAIOH news

As part of our service to members, in this newsletter we provide feedback on the latest developments within the Southern African Institute for Occupational Hygiene (SAIOH). SAIOH exists for its members and is reliant on them to continue to serve this noble profession ethically. Therefore, we invite your inputs and feedback on any matters communicated below.

PRESIDENT'S ADDRESS

Naadiya Mundy: SAIOH President
e-mail: president@saioh.co.za



Naadiya Mundy
Photograph: courtesy of SAIOH

Work environments: harmonising ethics and occupational hygiene

In the rapidly evolving contemporary work landscape, characterised by technological advancements, globalisation, and evolving work paradigms, fostering a workplace that is both safe and ethically responsible is critical. Honesty, transparency and integrity should be deeply ingrained in organisational policies, decision-making processes, and employee behaviour. These principles promote a positive work culture. Employees often look up to their leaders as role models; ethical leadership both influences employee behaviour and contributes to increased trust and cohesion within the organisation.

Occupational hygiene professionals play a vital role in the responsible use of technology. Safeguarding data privacy, ensuring fairness in artificial intelligence (AI) algorithms, and promoting responsible digital behaviour are imperative for maintaining ethical standards and employee trust.

A healthy workforce is a productive workforce. Acknowledging the importance of mental health, workplaces must implement strategies to reduce stigma, offer mental health resources, and cultivate a supportive work environment. Addressing stress, anxiety, and other mental health issues is essential for employee wellbeing and organisational productivity.

Remote work has become common since the COVID-19 pandemic. Employers should provide guidance on setting up workspaces, emphasising ergonomics, and encouraging regular breaks to mitigate any potential health risks associated with remote work.

Effectively managing occupational stress in the workplace is important as it can have detrimental effects on employee health, morale, and productivity. Employers should develop stress management programmes, encourage regular breaks, and provide access to stress-relieving activities to mitigate the adverse effects of stress on employee health and wellbeing.

Further reading

1. Iavicoli S, Valenti A, Gagliardi D, Rantanen J. Ethics and occupational health in the contemporary world of work. Int J Environ Res Public Health. 2018; 15(8):1713. doi: 10.3390/ijerph15081713.
2. Evans GS, Kloke H, Jahn S. Review of ethics for occupational hygiene hazard monitoring surveys using sensors. J Occupational and Environmental Hygiene, 2023; 20(10):439-451. doi: 10.1080/15459624.2023.2247018.

NATIONAL COUNCIL FEEDBACK

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Strategic plan and objectives

The targets within SAIOH's continuously evolving five-year strategy are consistently being met by our diligent Management Board. A signed-off strategy plan was circulated to all our members and launched at the annual general meeting (AGM) in October.

Ethics

SAIOH's Memorandum of Incorporation (MoI) is in the concluding stages of approval and was disclosed to SAIOH members during the AGM, where it was accepted.

SAIOH branch activities

The Western Cape branch hosted its second in-person meeting on 9 June 2023. Johan Coetzé discussed the use and application of Bayesian statistics in occupational hygiene. The Mpumalanga branch convened its second hybrid branch meeting on 11 August 2023 at Seritiza Coal in Middelburg. There were two presentations by personal protective equipment (PPE) providers and one by Trysome, regarding new technology to control indoor air quality (IAQ) in heavy-duty mining vehicle cabins. The KwaZulu-Natal branch hosted its second hybrid meeting on 31 August 2023. Prof. Jerome Lavoue (University of Montreal, Canada) spoke about industrial hygiene statistics and the use of ExpoStats for analysing occupational hygiene data.

SAIOH Annual Scientific Conference 2023

The hybrid 2023 SAIOH Annual Scientific Conference, which took place from 23 to 26 October this year, paired with the International Occupational Hygiene Association (IOHA) meeting, was a resounding success. A record number of SAIOH members attended, as follows:

- Five Professional Development Courses: 199 attendees (93 in person and 106 online)
- The two-day conference had 203 attendees per day (in total: 300 in person and 106 online)
- A total of 605 attendees (393 in person, and 212 online)

The Gala and awards evening, held under an elegantly decorated marquee, was a night to be remembered. We are pleased to announce that the Botswana Association of Occupational Hygiene (BAOH) will host the 2024 SAIOH Annual Scientific Conference.



Image: courtesy of SAIOH

International feedback

The SAIOH Professional Certification Committee (PCC) nominated Deon Jansen van Vuuren as the interim caretaker representative on the IOHA Board and the National Accreditation Recognition Committee (NARC). The nomination was approved by the SAIOH Management Board and the IOHA President was informed of this change.

The IOHA Board of Directors held its autumn meeting and AGM in Cape Town, hosted by SAIOH, on 22 October 2023. This coincided with the SAIOH 2023 conference.

Sad news

PC (Schu) Schutte died on 28 September 2023 after a short illness. Schu was a world-renowned researcher who specialised in heat stress management, acclimatisation, ergonomics, and fatigue management. Schu worked at the Chamber of Mines Research Organisation (COMRO), which later changed its name to the Council for Scientific and Industrial Research (CSIR) MiningTek, until his retirement. Although retired when he took ill, he was still actively involved in occupational hygiene, and assisting SAIOH and the mining industry in these fields of speciality.

SAIOH Technical Committee feedback

The SAIOH Technical Committee's research, pertaining to the measurement and the analyses of welding fumes, is in limbo. A sub-committee is being formed by SAIOH and the Occupational Hygiene Accredited Inspection Authorities (OH AIA) Association, to develop a position paper on this matter.

Our second technical committee has started developing technical procedures and a SAIOH position paper on heat stress management. A follow-up meeting took place in March 2023 and, on 31 July 2023, Schu Schutte (ex-Miningtek) presented a hybrid workshop on heat stress management. This joint mini conference, held at the Council of Scientific and Industrial Research's International Conference Centre (CSIR ICC), was attended by 187 SAIOH members – in person and online.

The Council Technical Co-ordinator, Wessel van Wyk, is finalising a position paper on real-time monitoring. As soon as this is approved by a sub-committee of the SAIOH PCC Executive Committee, it will be circulated to all SAIOH members and stakeholders.

Communications

SAIOH continues to communicate daily with its members and stakeholders, using various platforms.

FROM THE PROFESSIONAL CERTIFICATION COMMITTEE (PCC)

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Certification assessments

A summary of results from the March to September 2023 assessments is provided in Table 1.

The third quarter (Q3) PCC written assessments took place on 15 September 2023; virtual oral assessments were conducted from 13 October 2023 and concluded in November 2023.

PCC assessment improvements

The PCC technical teams continue to revise the PCC oral assessment format and questions in line with the occupational hygiene self-assessment tool; 14 of the 17 occupational hygiene modules have been completed.

Table 1. SAIOH PCC certification assessment results (November 2023)

	Written assessments (March–September) Q1, Q2, Q3				Oral assessments (March–November) Q1, Q2			
Certification category	**Assessed**	**Passed**	**Failed**	**Pass rate**	**Assessed**	**Passed**	**Failed**	**Pass rate**
	n	**n**	**n**	**%**	**n**	**n**	**n**	**%**
OH assistant	138	131	7	94.9	138	131	7	94.9
OH technologist	69	42	27	60.9	52	27	25	51.9
Occupational hygienist	48	29	19	60.4	40	28	12	70.0
Total	**255**	**202**	**53**	**79.2**	**230**	**186**	**44**	**80.9**

Two PCC technical teams are working in parallel. The first is updating the SAIOH self-assessment tool and revising the PCC oral assessment format, and the second is developing questions and the required answers. Improvements in the assessment format will ensure that the growth in the field of occupational hygiene is covered and that the assessment format and tools are relevant and current. The PCC Chief Examiner is improving the application and written assessment formats.

Occupational Hygiene Skills Forum (OHSF)

The OHSF was instrumental in coordinating the development of a series of asbestos training courses. The most recent, 'Asbestos Assessments in Buildings, Section 1: Introduction' is now available for use by OHSF-registered training providers. The assessments are administered by SAIOH for a fee per candidate. Please contact Lee Doolan for more information (lee@saioh.co.za).

SAIOH invited to SASOHN conference

The Southern African Institute for Occupational Hygiene (SAIOH) received an invitation to attend the 42nd South African Society of Occupational Health Nursing Practitioners (SASOHN) Conference, held at the Emperors Palace Convention Centre on 22–24 November 2023.

Karen du Preez, SAIOH Vice-President, attended the full-day conference programme on 23 November 2023.

The theme of the conference was *Orchestrating the best OHS team* and compared the elements of an occupational health and safety (OHS) programme and the stakeholders involved in OHS services, to instruments that form part of a symphony orchestra.

It emphasised the importance of collaboration and team-work to produce the 'symphony' of protecting the health and wellbeing of employees.

Congratulations to SASOHN President Michelle Bester and her team on a successful conference and thank you for inviting SAIOH.



SAIOH Vice-President, Karen du Preez (right), with SASOHN President, Michelle Bester (left), at the 2023 SASOHN Conference
Photograph: courtesy of SAIOH

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Powerful private sector partnerships

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INTRODUCTION

As part of the De Beers Group of companies, Venetia Mine partnered with the AfroCentric Group and South African Business Coalition on Health and AIDS (SABCOHA) towards the community health wellness campaign at Musina and Blouberg communities. The investment is in line with the Building Forever (BF) pillar for Partnering for Thriving Communities and, in particular, De Beers' health and wellbeing stretch goal, which aims at the reduction of HIV and TB infection rates, child and maternal mortality, the incidence of gender-based violence, and road accidents.

AfroCentric contributes funding to the SABCOHA community fund and is committed to strengthening the partnership approach and contributing to the sustainability of the programme. AfroCentric Employee Health Solutions (formerly Fastpulse) provided project management, clinical and technical oversight and, together with De Beers and SABCOHA, ensured overall oversight and achievement of all project goals.

Health testing services (HTSs) and wellness screening access points were deployed within the areas in Blouberg, Alldays, and Musina over a period of six months. HTSs for 25 000 individuals included HIV counselling and testing, and screening for tuberculosis (TB), sexually transmitted infections (STIs), blood pressure, glucose, body mass index (BMI), and vision. The wellness screenings support Government's Checka Impilo campaign – an accelerated national wellness campaign that focuses on testing and treating people for the human immunodeficient virus (HIV), TB, STIs, and non-communicable diseases such as hypertension and diabetes. To date, De Beers and AfroCentric have contributed more than R10 million towards the campaign.

LAUNCHING OF THE COMMUNITY WELLNESS DAY AT MUSINA

On 8 September 2023, the Community Wellness Day was launched at Musina, bringing together various stakeholders. The day formed part of a campaign launched in January by De Beers and AfroCentric to fund wellness screenings of more than 25 000 community members in the labour-sending areas surrounding Venetia mine, in the Vhembe and Capricorn districts of Limpopo province. The Community Wellness Day was attended by the Minister of Health, Honorable Dr Joe Phaahla; Vhembe District Executive Mayor, Dowelani Nenguda; Musina Local Municipality Executive Mayor, Godfrey Mawela; Deputy Chairperson of the Private Sector Forum, Dr Tshegofatso Gopane; Chairperson of the South African Business Coalition on Health and AIDS, Dr Thuthula Balfour (who is also



Stakeholders at the Community Wellness Day launched at Musina, 8 September 2023
Photograph: courtesy of MMPA

Head of Health at the Minerals Council); South African National AIDS Council (SANAC) CEO, Dr Thembi Xulu; Deputy Chairperson of SANAC, Steve Letsike; members of civil society, organised labour, traditional healers, faith-based organisations, management of Venetia Mine; and the AfroCentric group.

At the Wellness Day launch, various services were offered, such as health testing, registration of social grants and identification documents, highlighting the importance of integrating service delivery. The Minister of Health reiterated the importance of public-private partnerships in responding to the scourge of non-communicable diseases that is ravishing our communities. The Senior General Manager of Venetia, Ntokozo Ngema, committed to further investment in the communities around Venetia Mine.

The wellness screening campaign aligns with the United Nations Sustainable Development Goals (SDGs), the health objectives outlined in South Africa's National Development Plan (NDP), and the National Strategic Plan (NSP) on HIV/AIDS, STIs, and TB.

De Beers is also focusing on road safety as it transports its workforce to and from the mine. Road safety forms part of SDG 3, which is part of the Building Forever pillar for Partnering for Thriving Communities. De Beers has invested in a project to improve road safety in partnership with the Department of Transport on routes associated with its labour-sending areas, and strategic roads around the special economic zone in Musina.

De Beers has also established a programme called Living with Dignity to address gender-based violence.

RESULTS OF THE PROJECT

HIV

A total of 25 198 community members (50% male and 50% female) participated in HIV counselling. The majority (69%) of the participants were black and aged 25-49 years. Of the individuals who participated in HIV counselling, 24 570 participated in HIV testing (97.5% uptake), 2.4% declined testing due to known positive status, and 0.1% (with unknown status) declined HIV testing. Most of the individuals who participated in HIV testing, tested negative (99.4%).

Tuberculosis

- A total of 25 198 community members were screened for pulmonary TB.
- Thirteen participants were found to be on TB treatment.
- Forty-three participants had symptoms suggestive of TB and were referred to the local hospital for further investigation; all tested negative for TB.

Sexually transmitted infections

A total of 25 198 community members were screened for STIs; 57 (0.2%) had symptoms and were referred to local healthcare facilities for treatment.

Non-communicable diseases

Almost two-thirds (62%) of the participants had high BMIs, 9% had elevated blood pressure, and 3% had elevated blood glucose levels. Those with high BMIs were given health education and advised to see dieticians, while those with abnormal blood pressure and/or blood glucose were referred to the local hospital for treatment.

RECOMMENDATIONS

- The private sector needs to show commitment towards the implementation of the NSP 2023–2028.
- The AfroCentric and De Beers partnership initiative needs to be replicated across all provinces in South Africa.
- Partnerships with the Department of Health should be improved to ensure treatment initiation of all individuals screened and found at risk of ill health.
- Coordination between Government, private sector, and civil society is vital for successful health and safety initiatives.
- The high prevalence of obesity in our communities needs an integrated response between stakeholders.
- Integrating community health as part of the health strategy of organisations is needed to address the social determinants of health.