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Research findings are communicated to the scientific community in journals, through original research articles, short communications, and review articles, to name a few. Most journals still have an editorial for each issue, usually written by the editor of the journal. As a researcher, 2022 marks 20 years since I co-authored my first research article. Since then, I have published many research articles, short communications, and review articles in national and international journals, but I have never had the privilege of writing an editorial for an issue of any research journal.

The airborne transmission of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)1 raised awareness about the importance of indoor air quality (IAQ) in homes, public spaces, and places of work. Indoor air quality refers to the quality of air in and around buildings and structures, considering the risk that it poses to the health and comfort of those occupying these buildings. Poor IAQ is associated with immediate health effects such as headaches, dizziness, fatigue, and irritation of the eyes, nose, throat, and lungs, and long-term health effects such as respiratory diseases, heart disease and cancer.2 It also increases the risk of transmission and infection by airborne micro-organisms, such as SARS-CoV-2.1

The Pandemic has also increased the use of hand sanitisers, bleach, quaternary ammonium products, and other indoor air cleaning devices. These air cleaners make use of ozonolysis, photolysis and ionisation, to remove indoor air contaminants, but they can also generate harmful secondary chemicals.3 This results in even more complex indoor chemistry in addition to chemicals already introduced by cleaning, cooking, indoor combustion sources, moisture, emissions from building materials, carpets, furniture, electronics, and consumer products.3, 4

Within occupational health and safety legislation, such as the South African Environmental Regulations for Workplaces (1987),5 IAQ is currently addressed through regulations on thermal requirements (extreme cold and heat) and ventilation (natural or mechanical), and carbon dioxide content in the place of work. Carbon dioxide, along with other hazardous chemical agents, is also included in the Regulations for Hazardous Chemical Agents (2021).6 The Environmental Regulations for Workplaces (1987) is currently under revision by the Department of Employment and Labour. Considering the ever-increasing complexity and dynamics of indoor air chemistry and IAQ, there is a need for regulations that consider this complexity to ensure adequate IAQ at places of work. This will, in future, facilitate improvement in IAQ health risk assessments, exposure monitoring, and control measures. As with SARS-CoV-2, ventilation (as an engineering control measure that removes or dilutes airborne contaminants) will be the most important control measure to ensure adequate IAQ.

In this issue of Occupational Health Southern Africa, we publish an original research paper and an opinion related to noise, and a review paper on hazardous biological agents. Rikhoto et al. analysed occupational health risk assessment reports, from 21 facilities of four companies in the manufacturing and utilities sector, to identify noise abatement measures and to rate the effectiveness thereof. Of concern is the limited use of engineering control measures to reduce noise exposure, and a reliance on administrative control measures and hearing protection devices, which were found not to be effective in reducing noise exposures. The opinion, written by Drs Thomson and Delva, is also related to noise, specifically medical surveillance of noise-induced hearing loss. They present the current approach to mitigating hearing loss by monitoring for changes in standard threshold shift and percentage loss in hearing. They state a case for an alternative approach, making use of algorithmic pattern recognition of audiograms.

The review article by Gomba et al. discusses microbiological water quality concerns in buildings during periods of no or low occupancy, as experienced during the COVID-19 pandemic. The authors conclude that reduced water usage in buildings, due to closures during the Pandemic, can result in a deterioration of water quality, and that this should form part of risk assessments with appropriate implementation of control measures to reduce contamination risks.

To conclude, August is Women’s Month in South Africa. The Minerals Council South Africa celebrates this with an article about women in mining, and the progress (or lack thereof) that has been made with regard to increasing the proportion of women in the workforce, and addressing the challenges that they face, especially underground.

Johan du Plessis
OHSA Editorial Board member: SAIOH

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Women in mining in 2022

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Historically, women were prohibited from underground mine work according to the 1935 International Labour Organization (ILO) Convention. Many countries have since ratified and denounced this Convention, including South Africa, which did so in 1996. There have since been many efforts leveraged off South Africa’s comprehensive equality laws and regulations to increase the participation of women in all levels of work across the different sectors of the economy. However, despite a legal system that includes various laws that encourage diversity, and guarantees equal treatment at work, the South African mining sector is still not representative of the population, with a relatively low participation of women across all levels. According to the 21st Commission for Employment Equity Annual Report (2020–2021), only 16% of the employed mining population are women. This is 25 years after South Africa denounced the ILO Convention of 1935, prohibiting women from underground mining work. The transformation of the sector is happening too slowly and more needs to be done.

In recognition of the need for accelerated transformative actions in the sector, the Board of the Minerals Council South Africa commissioned research in 2019, which sought to identify the barriers that women faced in the mining sector, and the challenges that contributed to the high attrition rates of women, especially in core mining roles, over the long term. The results of the research were included in a white paper, which saw the establishment of the Minerals Council Women in Mining (WiM) initiative and the Women in Mining Leadership Forum (WiMLF) in August 2020. The WiMLF set stretch targets in its WiM strategy to at least double the percentage of women in mining by 2025, reaching 30–40% in the next five years, and ultimately achieving a 50% representation of women over the next decade. These are ambitious targets, which require focused and sustained effort on the part of employers to ensure that women’s needs are fully catered for in the provision of PPE, to ensure a safe working environment.

The results of Research Project SIM 100904 have been discussed at WiM meetings, and members and occupational health personnel have been conscientised about the findings and the upcoming amendments to the Mine Health and Safety Act, relating to the guidelines on the provision of PPE and the required mandatory code of practice.

Further to this, Minerals Council WiM members are part of the multi-stakeholder consultative team, which includes the Mine Health and Safety Council and the Department of Mineral Resources and Energy, and which is drafting formal guidelines and a code that will assist employers in providing suitable PPE for WiM, where required. The drafting of the Guideline is a crucial element in further developing legislation that practically removes barriers to women’s full participation in mining and ensures their safety.

Physical and sexual harassment are pervasive risks that women face daily in their operations on the mines. Harmful behaviour is practised between employees at various levels in the sector, and women are the most vulnerable due to the nature of the sector, its history, and traditionally held views, which are rooted in biases, toxic masculinity and a male-dominated culture. The settings in which many employees work contribute to, and exacerbate, their experiences of harmful behaviours.

A study was conducted by the Minerals Council WiM in 2021 to understand the drivers of gender-based violence and femicide (GBVF) in the mining sector. One of the findings indicated that the built physical environment, amongst other drivers, contributed to the risk of physical harassment that women face. This risk is heightened in core mining operations underground. Therefore, not only do women have to contend with fall of ground, chemical hazards, noise, dust inhalation, etc., but they also face the hazards of falling prey to harmful behaviours in constricted and poorly lit environments. This is especially the case where the ablution facilities are unisex, far from...
the rest of the team, and along paths that are not well lit. The physical environment is not the only contributing factor to the risks faced by women, but it is a significant contributor.

On 14 July 2022, the Minerals Council Mining Industry Occupational Safety and Health (MOSH) team launched the Underground Workplace Visibility Leading Practice. The event highlighted the adoption of light-emitting diode (LED) lights mounted on the rockface to improve visibility, and the ability to identify hazards timeously and improve production. A further positive linkage to improved visibility is improved physical safety for women working underground. The survey on PPE conducted by Minerals Council WiM found that women working underground sometimes delayed visiting ablution facilities during their long shifts, for fear of harassment. This has health implications as underground work is physically demanding, rendering women prone to health complications due to their physical safety fears. Improved underground workplace visibility is a welcome step in the right direction that will have positive outcomes for women’s health and physical wellbeing, creating safer work spaces for all.

Progress is being made, but more needs to be done to get greater participation and inclusion of women in the mining industry.

REFERENCES
Noise exposure abatement: a perspective from industry occupational health risk assessment reports

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ABSTRACT

Background: Occupational health risk assessments are building blocks for occupational health programmes, allowing for the rating of identified risks and the continuous re-evaluation of the effectiveness of abatement measures. In South African industry, occupational health risk assessments are formally documented in reports, which can be presented as demonstration of legal compliance with legislation.

Objective: To identify noise abatement measures recorded in noise risk assessment reports of four manufacturing companies and to rate their effectiveness.

Methods: We analysed the occupational health risk assessment reports from 21 operational facilities in four South African companies from the manufacturing and utilities sectors to evaluate, through document analysis, the recorded noise abatement measures. Noise abatement measure effectiveness was rated using a pre-assigned effectiveness percentage scale.

Results: Administrative controls and hearing protection devices were the most commonly used noise exposure abatement measures, but hearing conservation programmes were generally poorly formulated. There were inter- and intra-company differences in the qualitative risk assessment approaches used for rating or ranking the noise risk, which led to different risk conclusions and prioritisation outcomes. The calculated control effectiveness of the abatement measures showed that noise exposure remained largely unacceptable: 16 of the 21 operational units had unacceptable noise exposures, four had tolerable exposures, and one had broadly acceptable exposures.

Conclusion: The four companies' common noise abatement measures, as elements of formalised hearing conservation programmes, which included administrative controls and hearing protection devices, were not effective in reducing noise exposure to the broadly acceptable level, reflective of limited use of engineering controls.
The noise risk assessment, as envisaged in the NIHL Regulations of 2010, requires a comprehensive approach to noise control. This involves a systematic process to identify, assess, and control noise hazards. The risk management process is critical in ensuring that the risks associated with noise are managed effectively. The SANS 10083 (2013) standard provides guidelines for the implementation of noise control measures.

The NIHL Regulations require the implementation of the abatement hierarchy, which includes engineering controls, administrative controls, and personal protective equipment (PPE) such as hearing conservation programmes (HCP). The effectiveness of these controls is assessed through the noise risk assessment process. The objective of this study was to identify noise abatement measures implemented to prevent NIHL. The review of a company's noise risk assessment reports systematically and to identify noise abatement measures.

**Table 1. Effectiveness of hierarchy of control measures**

<table>
<thead>
<tr>
<th>Control Measure</th>
<th>Effectiveness</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elimination</td>
<td>100</td>
<td>Removal of noise source from facility.</td>
</tr>
<tr>
<td>Substitution</td>
<td>90</td>
<td>Measures replace the source of noise.</td>
</tr>
<tr>
<td>Separation</td>
<td>80</td>
<td>Measures reduce noise at the source or modify routes of noise emission.</td>
</tr>
<tr>
<td>Administrative Controls</td>
<td>50</td>
<td>Measures are regulatory or management practices.</td>
</tr>
<tr>
<td>HPDs</td>
<td>10</td>
<td>Devices such as earmuffs and earplugs.</td>
</tr>
</tbody>
</table>

The noise risk assessment, as envisaged in the NIHL Regulations of 2010, requires a comprehensive approach to noise control. This involves a systematic process to identify, assess, and control noise hazards. The risk management process is critical in ensuring that the risks associated with noise are managed effectively. The SANS 10083 (2013) standard provides guidelines for the implementation of noise control measures.

The NIHL Regulations require the implementation of the abatement hierarchy, which includes engineering controls, administrative controls, and personal protective equipment (PPE) such as hearing conservation programmes (HCP). The effectiveness of these controls is assessed through the noise risk assessment process. The objective of this study was to identify noise abatement measures implemented to prevent NIHL. The review of a company's noise risk assessment reports systematically and to identify noise abatement measures. The recorded exposure abatement measures were weighted in accordance with an effectiveness scale (Table 1), whereby the engineering measures (elimination, substitution and separation) were rated as having higher effectiveness than administrative controls and HPDs. Elimination carries a higher weighting as it excludes the noise source from the work area.

The overall control effectiveness was calculated by summing the pre-assigned effectiveness percentages for engineering and administrative controls, and HPDs (as shown in Table 1) into a single effectiveness score, expressed as the overall control effectiveness percentage. Thereafter, the residual risk, subtracted from the overall control score, was used to determine the tolerability of risk, using predefined acceptable categories. Following the control measure weighting, it is possible to allocate more resources towards efforts to reduce the risks rated as unacceptable. Conversely, employers are required to allocate fewer financial resources for the reduction of risks rated as acceptable.

The Health and Safety Executive (HSE) framework on tolerability of risk also outlines the level of risk acceptance relative to stated objectives, determines the ‘as low as reasonably practicable principle’ employers are required to allocate more resources towards efforts to reduce the risks rated as unacceptable. Conversely, employers are required to allocate fewer financial resources for the reduction of risks rated as acceptable.

The HSE framework on tolerability of risk provides decision-makers with a philosophical context, pits engineering controls against a hearing conservation programme (HCP), with engineering control given legal statutory precedent over other controls. The objective of this study was to identify noise abatement measures implemented to prevent NIHL. The review of a company's noise risk assessment reports covered the control aspects stated in Regulation 10 of the NIHL Regulations; the controls are divided into engineering and administrative controls, and HPDs. Elimination carries a higher weighting as it excludes the noise source from the work area. Engineering measures (elimination, substitution and separation) were rated as having higher effectiveness than administrative controls and HPDs. Engineering controls are the foremost option, followed by administrative controls and hearing protection devices (HPDs). When the risk assessment is conducted, the assessed risk is compared against the tolerability framework, to decide on the acceptability of remaining and assumed risks.

Sign in to view
<table>
<thead>
<tr>
<th>Company</th>
<th>Facility</th>
<th>Hierarchy of control element</th>
<th>Administrative controls</th>
<th>PPE</th>
<th>HCP formalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Engineering controls None</td>
<td>• Hearing conservation training</td>
<td>Non-specific earmuffs or earplugs or customised HPDs</td>
<td>Formalised</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>None</td>
<td>• Hearing conservation awareness • Noise survey • Audio medical surveillance</td>
<td>Non-specific hearing protection</td>
<td>Formalised</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>None</td>
<td>• Zoned noise areas • Noise survey • Training/awareness • Medical surveillance</td>
<td>Non-specific hearing protection</td>
<td>Not formalised</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>None</td>
<td>• Noise survey</td>
<td>None mentioned</td>
<td>Not formalised</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>None</td>
<td>• Periodic (and refresher) training on safe work procedures and PPE • Annual audiometric testing</td>
<td>Personnel make use of ear plugs and earmuffs</td>
<td>Not formalised</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Maintenance and lubrication of plant machinery • Audiometric testing • Site-specific training and education on safe work procedures and control measures • Reduction of exposure time</td>
<td>• Audiometric testing • Site-specific training and education on safe work procedures and control measures</td>
<td>HPDs with noise reduction rating ranging from 24 to 30 dB</td>
<td>Not formalised</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>None</td>
<td>• Noise zones identified and conspicuously demarcated by using required pictogram • Periodic (and refresher) training on safe work procedures and PPE • Annual audiometric testing</td>
<td>Personnel make use of ear plugs and earmuffs</td>
<td>Not formalised</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>None</td>
<td>• Audiometric testing • Noise survey • Awareness sessions</td>
<td>Use of HPDs</td>
<td>Not formalised</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Non-specific engineering controls reported</td>
<td>• Noise zone demarcation • Audiometric testing • Noise survey</td>
<td>Non-specific PPE reported</td>
<td>Formalised</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>None</td>
<td>• None</td>
<td>None</td>
<td>Not formalised</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>• Cabin and spreader enclosures lined with acoustic absorptive material • Fly ash conveyor automation • Regular maintenance of conveyor belt and motors</td>
<td>• Cabin and spreader enclosures lined with acoustic absorptive material • Fly ash conveyor automation • Regular maintenance of conveyor belt and motors</td>
<td>Disposable coded earplugs with NRR of 34 dB</td>
<td>Not formalised</td>
</tr>
</tbody>
</table>

**dB:** decibel, **dBA:** A-weighted decibel, **PPE:** personal protective equipment, **HCP:** hearing conservation programme, **HPD:** hearing protection device, **NRR:** noise reduction rating, **NIHL:** noise-induced hearing loss.

* Company C Facility 5 required no further abatement measures as the reviewed risk assessment report indicated that noise sources were eliminated.
Table 3. Control effectiveness statement and resultant risk classification for each operational facility of the participating companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Facility</th>
<th>Hierarchy of control elements</th>
<th>Effectiveness of current controls</th>
<th>Statement</th>
<th>Risk classification</th>
<th>Further proposed abatement measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Engineering controls</td>
<td>  </td>
<td>Medium</td>
<td>Assessment will be done as per the NIHL Regulations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Administrative controls</td>
<td>  </td>
<td>High</td>
<td>No additional controls identified in report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>PPE</td>
<td>  </td>
<td>High</td>
<td>No additional controls identified in report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>PPE</td>
<td>  </td>
<td>Low</td>
<td>No additional abatement recommendations made</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Engineering controls</td>
<td>  </td>
<td>Medium</td>
<td>• Explore viability of installing engineering control measures as required by Regulation 10 of the NIHL Regulations • Loose, vibrating components on equipment generate rattling noise and should be repaired to reduce exposure to noise</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>PPE</td>
<td>  </td>
<td>Low</td>
<td>No additional abatement recommendations made</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Engineering controls</td>
<td>  </td>
<td>Medium</td>
<td>• Explore viability of installing engineering control measures as required by Regulation 10 of the NIHL Regulations • Loose, vibrating components on equipment generate rattling noise and should be repaired to reduce exposure to noise</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>PPE</td>
<td>  </td>
<td>Medium</td>
<td>Develop and maintain an occupational hygiene programme</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Engineering controls</td>
<td>   </td>
<td>Medium – high</td>
<td>No additional abatement recommendations made</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Engineering controls</td>
<td> </td>
<td>Acceptable</td>
<td>Audiometric testing</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>PPE</td>
<td>Not stated</td>
<td>HCP</td>
<td>Noise reduction plan proposed</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>Engineering controls</td>
<td>  </td>
<td>Medium</td>
<td>Occupational hygiene monitoring programme</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Administrative controls</td>
<td>  </td>
<td>Low</td>
<td>Maintain controls in place for compliance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>PPE</td>
<td> - -</td>
<td>Negligible</td>
<td>No further action required</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>PPE</td>
<td>  </td>
<td>Low</td>
<td>No additional abatement recommendations made</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>PPE</td>
<td> - -</td>
<td>Negligible</td>
<td>No further action required</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>PPE</td>
<td>  </td>
<td>Low</td>
<td>No additional abatement recommendations made</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>PPE</td>
<td> - -</td>
<td>None proposed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>PPE</td>
<td> - -</td>
<td>None proposed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PPE: protective personal equipment

The assigned effectiveness percentages for each control indicate that elimination is the most effective measure for noise control. Residual risk percentages > 0% indicate the implemented measures’ inabilities to eliminate the noise, hence the need for implementation of the continuous HCPs. Continuous HCPs require employers to conduct noise monitoring, audiometric testing, noise zoning, and noise monitoring at prescribed frequencies.
Table 4. Control effectiveness and residual risk percentages of existing abatement measures

PPE: protective personal equipment

*using HSE-defined tolerability of risk framework

HPDs, followed by a range of administrative measures. Engineering controls as a first consideration within the hierarchy of control principle was the least utilised measure across all companies. Both the administrative controls and HPDs are basic controls catered for within the NIHL Regulations and the SANS 10083 (2013) requirements. The HCP formalisation in some of the companies' operational facilities' reports had little information about the programme elements. The HCP formalisation in the context of this study means that the risk assessors explicitly mentioned the HCP in the risk assessment report, with corresponding verifiable programme elements listed. The HCP, itself, is a risk management tool for the reduction of NIHL.

Identified noise controls and risk characterisation

The effectiveness of implemented abatement measures should be considered during the risk evaluation and included in the analysis processes of a risk assessment. Table 3 shows the consideration of the effectiveness of abatement measures, as a whole, on the overall outcome of the risk assessment process, and proposed additional abatement measures. Certain operational facilities of Companies A, C and D had no proposed abatement measures in spite of the noise risks being rated as high. The risk assessment report of noise at Company D had no risk conclusion statement, unlike those of Companies A, B and C, adding ambiguity as to what the next risk management steps for eliminating noise at this company might be.

Management decisions about future expenditures are grounded on outcomes that consider the effectiveness of current controls. Thus, if the conclusion of the risk evaluation step is incorrect, it has a detrimental effect on the allocation of financial resources for future exposure abatement.

Effectiveness of controls and tolerability of risk

The recorded existing noise controls were assigned corresponding effectiveness percentage scores, derived from Table 1, and an overall control effectiveness score, from which residual risk percentages were calculated, as shown in Table 4. The residual risk percentages were assigned to the corresponding risk level, derived from the HSE framework on tolerability of risk 20 (broadly acceptable, tolerable, and unacceptable).

The tolerability of the residual noise risks for Companies A, C and D were classified as unacceptable, which reflects an over-reliance on administrative controls and HPDs as the controls of choice. The noise risk of Company B was 'tolerable', reflecting the effectiveness of engineering controls compared to that of administrative controls and HPDs. In assigning final risk scores, certain operational facilities of Company B used both qualitative (controls and likelihood) and quantitative (noise levels) variables to allocate risk rating. Companies A, C and D relied on only qualitative variables for assigning final risk ratings.
None of the evaluated risk assessments recorded the reasons for the noise level being at or above the noise rating limit, but it was not clear if this was done. On this point, employers need to give due consideration to the noise rating limit, as it is a critical factor in determining the appropriateness of the control measures. The risk assessment should assist employers to identify and institute immediate control measures to prevent exposure. The persistence of noise exposure, although this is required in the NIHL Regulations. In such cases, the risk should be assessed as not adequately controlled. The risk assessment should comply with legal requirements and national standards. The administrative controls and the use of different HPDs that are considered tolerable. Assigning noise as a low risk prevents it from being prioritised for further risk treatment – a possible reason for the poor or sporadic implementation of engineering controls. If a risk assessment outcome ranks noise as a low risk, then the employers would be justified in not taking action to further reduce the risk. The findings of the study revealed that current exposure abatement measures do not exaggerate the control effectiveness potential of the noise from the workplace were being used for risk reduction rather than risk avoidance. The technical nature of noise in these companies highlighted the need to conduct quality risk assessments that involve trained, highly motivated and experienced teams.

Another objective of a risk assessment is to recommend further abatement measures should be expressed during the risk assessment, influence subsequent risk scoring, risk prioritisation, and change the likelihood of exposure. If a risk assessment outcome ranks noise as a low risk, then the employers would be justified in not taking action to further reduce the risk. If a risk assessment outcome ranks noise as a low risk, then the employers would be justified in not taking action to further reduce the risk. The effectiveness of implemented control measures should be considered to further reduce residual risks.

Similar to not adhering to the requirement that a statement be made concerning the nonprescriptive nature of the risk assessment process in its current form, as described in Regulation 6 of the NIHL Regulations, complicates decision making for additional risk treatment – a process undertaken for the purpose of risk reduction. Risk assessors have a professional duty to ensure that abatement measures do not result in prohibitive costs as the risk would have been reduced to as low as reasonably practicable, whereas risks assigned as acceptable will need to be reassessed and controlled.

Uncertainty of risk assessment outcomes and ensuing decision making for additional risk treatment – a requirement of the NIHL Regulations. The record-keeping of risk assessments is important for regulatory compliance as it provides evidence of the risk assessment process and the implementation of control measures. The nonprescriptive nature of the risk assessment process in its current form, as described in Regulation 6 of the NIHL Regulations, complicates decision making for additional risk treatment – a process undertaken for the purpose of risk reduction.
introduces objectivity for actioning envisaged preventive or corrective risk characterisation decisions. The effectiveness control percentage identify the reasons that the noise levels exceeded the noise rating engineering controls were an outcome of a requirement for employers to ambiguous about whether the recorded engineering controls were could thus not be followed up with company representatives who relied on secondary data, and errors and omissions in the records of interest.

The authors declare that this is their own work; all the sources used in search for better approaches in preventing industrial health risks.

3. Occupational health risk assessments conducted in industry

2. Administrative controls and HPDs are commonly implemented as

default approaches in the formalisation of hearing conservation programmes is lacking preference to engineering controls. The noise risk assessment process the commonly recorded control measures in the four companies, in company practices, in general. These control measures undoubtedly legal requirement, and the evaluation of effectiveness, are established

guidance for employer action to reduce or prevent residual risks. The
ments and risk prioritisation for further risk treatment, with minimal

demanding process. Administrative controls and HPDs (elements of HCPs) were

in the company representatives' risk assessment reports.

Unacceptable noise risks are indicative of the fact that administra-

tive controls and HPDs do not eliminate or reduce the noise from the

quantification of the effectiveness of recorded controls yielded unac-

The study had some limitations in that the risk assessment analysis

Sign in to view
Water quality challenges in buildings during prolonged low or no occupancy: a cause for concern during COVID-19 lockdowns and related building closures

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Keywords: SARS-CoV-2, low-occupancy buildings, water stagnation, microbiome, Legionella


ABSTRACT

Introduction: In compliance with the COVID-19 lockdown restrictions, many non-essential workplaces and public spaces were closed or left sub-operational with no or low occupancy for several months. The abrupt and unprecedented long periods of building closures have raised concerns about the proliferation of opportunistic premise plumbing pathogens that may be a biohazard for returning occupants.

Objective: In this review paper, we discuss microbiological water quality concerns during periods of no or low occupancy, as experienced during the COVID-19 lockdowns.

Methods: PubMed and Google Scholar databases were searched for peer-reviewed articles using specific keywords. The literature search was extended to grey literature. The paper focuses on Legionella, as a pathogen of concern, in building water systems that are not well managed and the potential risks to workers and other occupants.

Results: Most articles suggest a positive relationship between stagnation or reduced water usage and compromised microbiological quality of building water systems, but the effects are site-specific and are associated with biofilm formation and disinfectant decline. Considerations for building water risk assessment are discussed as a decision-making framework for selecting appropriate responses to anticipated changes in water quality.

Conclusion: The unprecedented building closures due to COVID-19 lockdowns present a hazardous event likely to impact building water quality. Building owners and facility managers, especially in high-risk settings, should consider conducting risk assessments of water systems during low-occupancy periods to identify potential risks and apply appropriate corrective measures, where necessary.
We anticipate that this information will assist building owners, facility managers, environmental health practitioners, infection control personnel, health and safety officers, occupational hygienists, and other stakeholders to proactively manage the risk of opportunistic pathogen-related illnesses in the built environment.

METHODS

We searched PubMed and Google Scholar for peer-reviewed articles published in English from 2000 to 2021, using keywords related to water quality in large buildings, i.e. stagnation, disinfectant residuals, biofilms, *Legionella* growth, risks and control, and *Legionella* risks during COVID-19 lockdown. Reference lists of selected articles were manually searched to identify additional papers (Figure 1). We included both field and experimental primary research studies on PPSs. Grey literature was included, specifically guidance documents on managing *Legionella* risks during COVID-19 building closures, from internationally recognised institutions or government agencies such as the Centers for Disease Control and Prevention, United States of America (CDC USA), American Water Works Association (AWWA), and the European Study Group for *Legionella* Infections (ESGLI). Publications focusing on temperature, plumbing materials, chemical contaminants, municipal distribution systems, and cooling towers were excluded as they were considered beyond the scope of this paper. Studies were characterised using the following variables: origin, type of building, water usage pattern, parameters assessed (population) and detection methods, main findings (outcomes), and recommendations.
Sign in to view
USA23 Field study, Switzerland21 Field study, UK24 Field study, Simulation, Germany19 Field study, study the duration of chlorine for
sity housing hours regular office 
es working
water chlorinated
ing receiving
medium-sized
houses and
12 private
storey univer-
building with
Cold and hot
drinking water 
freshly treated
ise plumbing
history
with
Legionella
nursing home,
residential and
showers) from
(taps and
Cold water 
house; cold
features and a
conservation
and energy
buildings
from the same
treated water
served with
houholds
from taps in
Cold water
Christmas holi-
weekend and
experienced
on location in
depending
Variable,
tion periods
create stagna-
tested
conditions
operating
Standard
TCCs, ICCs
FCM
microbiome
Cell counts,
sequencing)
(16S rRNA Illumina
FCM, molecular
microbial parameters detected at higher
• Flushing reduced microbial load in less
• Water from infrequently used taps had
• Small-diameter distal end pipes had
• Bacterial community composition
• Microbial biomass (HPC, ATP levels and
• Viable microbial biomass increased due
• Decay of residual chlorine due to biofilms
• Pathogenic gene copies and total bacte-
• Rapid disinfectant loss in all green
• Cell concentrations returned to normal
• Microbial composition shifts observed
• TCCs, ATP levels, and HPCs increased after
• Development of validation methods
• Short flushing of taps prior to use to
• Precise flushing of smaller-diameter
• Hospitals and extended care facilities
• Total 16s rRNA gene copy counts) higher
• Total bacterial counts and deviated most
• TCCs and depleted disinfectant residual
• High cell counts and deviated most
• Annual infection risk compared
• Legionella occurrences significantly
• Legionella annual infection risk compared
• Parameters that lead to colonisation
• Longitudinal rather than cross-sec-
• Avoid unnecessary water storage in
• Estimation of
case water retention in buildings
• Avoidance of long-term stagnation
• Inadequate pipe length
• Relying on clean pipes
• Chlorine, and suppress biofilm growth,
• Green building designs with water
• Temporary solution for green build-
• Green building designs with water
• Parameters that lead to colonisation
• Chlorine, and suppress biofilm growth,
• Parameters that lead to colonisation
• Chlorine, and suppress biofilm growth,
Sign in to view
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Disinfectant residuals in PPSs. The lack of pre-COVID-19 data presents challenges during COVID-19 lockdowns, may exacerbate the degradation of microbial counts in a study in three four-storey buildings in Champaign, USA. Water samples and were negatively correlated with microbial cell counts. Additional research to establish the impact of long-term stagnation periods, as experienced in some buildings, before entering buildings for the intended use. Nevertheless, disinfectant residuals concerns for informing risk prediction and mitigation.

Table 3. Considerations for building water quality risk assessment for potential microbial growth during reduced or increased water usage. Extended stagnation periods, as experienced in some buildings, before entering buildings for the intended use. Nevertheless, disinfectant residuals concerns for informing risk prediction and mitigation. Systematic sampling to build statistical confidence, would be valuable for informing risk prediction and mitigation.9

Disinfectant residual concerns for informing risk prediction and mitigation.9

Potable water is disinfected to meet prescribed national standards. Disinfectant residual concerns for informing risk prediction and mitigation.9

Flushing of less used outlets, and water quality monitoring and routine maintenance of control systems to action.

Activity Consideration Comment

Rate the remaining risk under the existing control between the RA and the responsible manager(s). How effective the control is for the risk, and may have moderate to catastrophic consequences, requiring immediate corrective action.44

There are no occupational exposure limits for Legionella and other OPPPs. There are no set standards to define unacceptable levels of microorganisms, including Legionella. All microbiological testing should be performed by a competent laboratory. There are no occupational exposure limits for Legionella and other OPPPs. There are no set standards to define unacceptable levels of microorganisms, including Legionella. All microbiological testing should be performed by a competent laboratory.

Legionella

Legionella

Depends on the purpose of the building, services used, potential sources of contamination (low-use / high-risk outlets), e.g. aerosol-generating devices, proximity to, aerosol-generating devices. Exposure assessment to decide who might be exposed to Legionella

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Legionella amplification. Quality, particularly regarding the appropriateness of disinfectant residual as an indicator of water quality experts, and were mentioned in several guidance documents, important parameter for monitoring building water quality by subject water standards. Further research is therefore needed to determine disinfectant residuals is generally not a requirement for most drinking can be exposed to OPPPs when showering and bathing. In a study Table 4. Considerations for verification of the effectiveness of control measures or remedial actions

Where to sample?

• Temperature monitoring may provide a good indicator that a flushing programme is moving sufficient water through the system.

• Other parameters, such as disinfectant residuals (chlorine/chloramine) and temperature (hot and cold water), should be measured onsite during sampling, and benchmarked with the city's main water supply. Disinfectant residual monitoring provides a good indicator that building water turnover is positively with biofilm TCC. They also reported that frequently used showerheads, faucets, and humidifiers in high-occupancy buildings generally, any water source that may generate aerosols should be considered a potential source for transmission. Choice of test method in testing laboratory if outsourcing

• To determine effectiveness of corrective action, sampling and testing should be repeated to ensure that the water is safe for use.

• Sampling frequency should be informed by a site-specific RA and should reflect a balance of the benefits and the costs of obtaining more information.

• Use personnel with competency in sampling procedures and sample handling as this may affect laboratory results and response action.

• Sample type information must be reported to ensure that results are interpreted correctly and that appropriate recommendations are made. It is generally recommended to flush at least 2–3 minutes prior to drawing the first sample, for representation of the actual conditions in the plumbing system.

• Consider proximity of facility to testing laboratory to ensure sample integrity is maintained during transport. Long-distance shipping will require cold transport to cause infections in susceptible populations. The first flush upon re-opening upon re-opening is a possible point of concern for human exposure to the water column, with the potential to reach PoU at doses sufficient to cause infections in susceptible populations. This calls for science-based evidence of the efficacy of maintenance procedures on biofilms, to guide mitigation strategies. Following unprecedented stagnation periods over several months can result in the proliferation of bacterial proliferation and biofilm development. Microbial proliferation and biofilm development can be exposed to OPPPs when showering and bathing. In a study, shower hoses had the highest biofilm concentrations after weekend stagnation, and biofilm TCC was significantly higher in shower hoses of pipes with biofilms compared to those without biofilms. Proctor et al. (2018) reported that L. pneumophila survival,54, 55 further reducing the efficacy of disinfectants. Biofilms can be exposed to OPPPs when showering and bathing. In a study can be exposed to OPPPs when showering and bathing. In a study
systemic. In fact, contamination via patients and workers or from the sink environment – than in PPSs appears to be more external – as retrograde source of did not consider them in our review for various reasons. For example, the research is needed to understand how these OPPPs respond in premises that should not be ignored as they are difficult to eradicate once established. More

Department of Employment and Labour, RAs, guided by competent strategy, choice of test methods, and interpretation of results. Although this information is critical, some effectiveness of control measures or remedial actions following periods of conducting an RA of a building’s water system, several critical issues must be person(s), should be carried out on water systems that have been idle for

2. Every building is unique and the microbial quality of the water is dependent on several factors, which should be considered when assessing

3. Control measures to reduce contamination risks should be guided by

1. Reduced water usage due to building closures, as experienced during

There is a potential for microbial growth in some PPSs, following COVID-19 lockdowns, and warnings to be mindful of the associated health hazards, such as legionellosis, are understandable. Building owners and facility managers regarding disinfectant resistance and growth in biofilms in PPSs, we

P. aeruginosa is rarely detected in bulk water samples within plumbing systems. Consequently, most prevalence studies on infections. Furthermore, P. aeruginosa, share common characteristics with other OPPPs and other OPPPs are of growing concern and


P . aeruginosa, P. fluorescens, and other opportunistic pathogens (OPPPs) are of growing concern and

Legionella prevention and control. More research on the risk factors for the ‘one-health’ approach to managing building water quality and infection

Key Messages

Conclusion

Table 4 summarises important points to consider when verifying the effectiveness of control measures and ‘fitness-for-use’ of the water
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Should algorithmic pattern recognition be included in medical surveillance of noise-induced hearing loss?

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Andy Thomson is a member of SASOM

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A significant number of 'notch' may be reduced or disappear, as described above. Because notches are generally more obvious in early NIHL as, over time, adjacent frequencies are affected and the prominence of the pattern sometimes cannot be readily differentiated from common diseases associated with high-frequency hearing loss. As NIHL advances to the point where an STS does occur, the pattern sometimes cannot be readily differentiated from common diseases associated with high-frequency hearing loss. Furthermore, the characteristic notch pattern of NIHL, with a peak loss in lower frequencies – important for hearing speech – has a higher weighting than higher frequencies. Therefore, it is probably better to include algorithmic pattern recognition in the screening methodology to detect NIHL at an earlier stage, with higher sensitivity and specificity.

A few STS’s have been proposed to standardise the audiogram pattern for NIHL diagnosis. This is advocated by SANS 10083:2013 in South Africa. In section 18.6 of this Standard, it is required to compare periodic screening audiometry results with the baseline audiometry results. This methodology is advocated by SANS 10083:2013 in South Africa. In section 18.6 of this Standard, it is required to compare periodic screening audiometry results with the baseline audiometry results. This methodology is advocated by SANS 10083:2013 in South Africa. In section 18.6 of this Standard, it is required to compare periodic screening audiometry results with the baseline audiometry results.

We believe these gnomonic of NIHL but highly suggestive in noise-exposed people with no documented noise exposure, so it is not pathogenic. It must be noted that notches occur in a significant number of individuals. It is thus important to apply such algorithms only to noise-exposed employees. Several computerised algorithms and machine-learning models have been produced and tested in order to diagnose NIHL, with varying results. We are testing our computerised algorithms on the low frequencies affected by non-occupational causes. It produces frequent false positive results because it focuses on the low frequencies affected by non-occupational causes. It is thus important to apply such algorithms only to noise-exposed employees.

REFERENCES


Community of practice on occupational health and safety — 2021 annual tuberculosis and occupational health and safety regional response progress report meeting

INTRODUCTION
The tuberculosis (TB) burden in the southern African region is attributed to the high HIV prevalence and mining environment, which exposes mine workers to inhalable dust and predisposes them to occupational lung diseases (OLDs), such as silicosis. Against the background of the migratory nature of mine workers from labour-sending areas to mining communities, within and across borders, and weak occupational health and safety (OHS) regulatory systems, the Southern Africa TB and Health Systems Support (SATBHSS) project has adopted a regional multi-sectoral approach to respond to TB and OLDs. To reduce the high incidence of TB among mine workers, primary prevention has been emphasised through strengthening OHS regulatory systems and services in the project countries. The project also focuses on strengthening collaborations between the public and private sectors in the fight against TB and OLDs. The African Union Development Agency (AUDA-NEPAD) will continue supporting the region and the project countries to strengthen their capacity to offer workers occupational health and safety (OHS) services and engage the private sector for an effective and sustainable response to TB and OLDs.

The community of practice on occupational health and safety (CoP-OHS) was established in 2017 to share knowledge and experience towards solving the challenge of OLDs and TB in four project countries (Lesotho, Malawi, Mozambique, and Zambia). In an endeavour to foster and encourage a collective regional response to the scourge of TB and OHS in the region, four more member states were added, viz. Eswatini, Botswana, Tanzania, and Zimbabwe. The meeting was attended by South Africa’s Department of Employment and Labour, the International Labour Organization (ILO), the International Organisation for Migration (IOM), the Southern Africa Development Community (SADC), and the World Health Organization (WHO) as key partners; they shared their expertise on issues related to TB and OHS. This CoP-OHS supports countries to i) roll out a standardised package of occupational health services and mining safety standards, and ii) strengthen mine health regulatory capacity. It is attended by TB and OHS experts from ministries of health, mines, and labour; and chambers of mines.

The main objectives of the CoP-OHS meeting were to provide technical input on the draft code of practice on OLDs, to review and advise on developing the OHS information system, to forge the alignment of regional projects such as TB in the Mining Sector (TIMS), and the United States Agency for International Aid (USAID) project on artisanal small-scale miners (ASMs), and to discuss the proposed COVID-19/OHS workplace response plans.

METHODOLOGY
This was a hybrid meeting, with the majority of the members attending the meeting in person at Radisson Blu hotel, Sandton, Johannesburg, South Africa. The data for the report were collected from the meeting concept note, meeting agenda, presentations, observations, and dialogues.

MEETING CONSTITUTION
The CoP-OHS meeting was attended by 25 participants from Botswana, Eswatini, Lesotho, Malawi, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe, AUDA-NEPAD, the ILO, the WHO, and the IOM.

OPENING REMARKS
The AUDA-NEPAD re-iterated the importance of the community of practice on CoP-OHS as a strategic vehicle to accelerate regional OHS harmonisation, innovation, knowledge sharing, and policy development. Due to the CoP-OHS impact, the membership has been extended to Botswana, Eswatini, Tanzania, and Zimbabwe, including South Africa, which has always been part of the CoP-OHS. The WHO, the IOM, and the ILO remain key strategic partners for the enhancement of OHS in the region.

Since the inception of the CoP-OHS, some of the achievements attained include the revision or development of OHS laws and regulations, implementation of a regional baseline study on mine health regulation and OHS results, development of human resources capacity in OHS, OHS systems strengthening, OHS information management system design, and many more interventions.

Project progress and impact on strengthening OHS system in southern Africa
Regional progress
AUDA-NEPAD has spearheaded training in several areas. Twenty-eight Malawian and Zambian medical doctors and radiologists were trained on the ILO International Classification of Radiographs of Pneumoconioses (ILO-ICRP). These doctors and radiologists have improved occupational health service delivery, especially in remote areas. Forty-five occupational health nurses from Lesotho, Malawi, and...
Mozambique were trained on the fundamentals of OHS. These trained health professionals are providing services in the countries. Seventy-one OHS inspectors from Lesotho, Malawi, and Zambia were trained on risk assessment, and practical sessions were conducted on the use of inspection equipment. The training imparted skills and knowledge that capacitated the inspectors to effectively utilise the equipment procured under the project. Thirty-five occupational hygiene professionals were trained on measurements (W501) and controls (W505) of hazardous substances in Mozambique and South Africa. In addition, AUDA-NEPAD trained more than 450 Government officials from Lesotho and Malawi on sector-specific COVID-19 workplace response and intervention measures.

The CoP-OHS provided guidance on developing a regional code of practice for the management of occupational lung diseases (CoP-OLDs). The CoP aims to guide countries to harmoniously undertake comprehensive and quality medical surveillance and manage OLDs in workplaces. It received overwhelming support from the Southern African Development Community (SADC), where several member states, such as Botswana and Namibia, have shown a keen interest in adapting it. The CoP-OLDs is a critical document to accelerate the compensation of current workers and ex-workers for OLDs. Notably, the document will assist member states to expedite the establishment of their own compensation systems.

**In-country progress**

The Government of Malawi has recruited an occupational health specialist and trained more than 65 professionals on the ILO-ICRP, occupational hygiene, occupational health nurses’ roles, and mine workplace inspections. The Government inaugurated four occupational health centres and purchased various occupational health diagnostic equipment. These efforts resulted in the initiation of inspections of workplaces for compliance to national standards and the training of workers on the proper use of personal protective equipment (PPE).

**Table 1. Lesotho mining industry COVID-19 statistics**

<table>
<thead>
<tr>
<th>Mine</th>
<th>COVID-19 tests</th>
<th>Negative test result</th>
<th>Positive test result</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Mine 1</td>
<td>463</td>
<td>451</td>
<td>97.4</td>
<td>12</td>
</tr>
<tr>
<td>Mine 2</td>
<td>3 195</td>
<td>3 121</td>
<td>97.7</td>
<td>74</td>
</tr>
<tr>
<td>Mine 3</td>
<td>2 175</td>
<td>2 128</td>
<td>97.8</td>
<td>47</td>
</tr>
<tr>
<td>Total</td>
<td>5 833</td>
<td>5 700</td>
<td>97.7</td>
<td>133</td>
</tr>
</tbody>
</table>

In Zambia, the focus was on the development of occupational health and hygiene standard operating procedures. The country trained 83 professionals on the ILO-ICRP, and completed the renovation of the Solwezi occupational clinic, which is now operational. Most (80%) of the total inhalable dust samples in the mines were compliant with the set occupational exposure limit (OEL) of 3 mg/m³.

**Strengthening occupational health services in Africa**

AUDA-NEPAD presented on the status of the OHSCs in southern Africa, which were initially designed to provide TB screening and diagnosis services, HIV testing, silicosis screening and diagnosis, and linking of ex-mine workers to compensation funds. These are meant to unlock significant compensation funds for ex-mine workers in South Africa, Lesotho, Malawi, Botswana, Mozambique, and Eswatini for TB and other lung diseases. Through the Global Fund, the region established 11 OHSCs: two each in Eswatini, Mozambique, and Lesotho, and one each in Namibia, Zambia, Tanzania, Botswana, and Zimbabwe. Table 2 summarises the operational status of OHSCs in each country.

Drawing lessons from the TIMS and SATBHSS projects on OHCs, AUDA-NEPAD, the Tshiamiso Trust, and the Medical Bureau for Occupational Diseases (MBOD) held a meeting to develop a sustainable AUDA-NEPAD, the Tshiamiso Trust, and the Medical Bureau for Occupational Diseases (MBOD) held a meeting to develop a sustainable ideal OHSC blueprint in Cape Town, South Africa. The ideal OHSC blueprint aims to provide guidance and support for the implementation of fully fledged sustainable, OHSCs in various African Union (AU) member states.

**Table 2. Regional OHSCs operational status**

<table>
<thead>
<tr>
<th>Country</th>
<th>Current operational status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eswatini</td>
<td>Two OHSCs are open with the support of internal voluntary deferred pay (VDP) and functioning on low funds after the TIMS project.</td>
</tr>
<tr>
<td>Lesotho</td>
<td>Three OHSCs are open and functioning, running on internal Global Fund savings from the National TB Control Program (NTCP) Grant.</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Three OHSCs are open and supported by the SATBHSS project, but face challenges regarding sustainability after the project.</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Both OHSCs are closed due to lack of funds. Plans are underway to re-open them before the end of 2022, using a different funding mechanism.</td>
</tr>
<tr>
<td>Zambia</td>
<td>The OHSC is open and functional, and is currently being funded, month-by-month, from the fiscal budget. The sustainability of this funding is not assured. There are plans to incorporate the OHSC budget into the fiscal budget permanently.</td>
</tr>
<tr>
<td>Namibia</td>
<td>The OHSC is open and functional, but not ‘as usual’. It is now being used to provide spill-over primary healthcare services from the nearby health service centre.</td>
</tr>
<tr>
<td>Botswana</td>
<td>The OHSC is open and functional as usual. It is currently being funded month-by-month from the fiscal budget. There are plans to incorporate the OHSC budget into the fiscal budget permanently.</td>
</tr>
<tr>
<td>Tanzania</td>
<td>The static OHSC is open and functional as usual. The mobile OHSC is closed and non-functional.</td>
</tr>
<tr>
<td>Malawi</td>
<td>Four OHSCs are being established in Government hospitals.</td>
</tr>
</tbody>
</table>
Forging the future for the Centre of Excellence on OHS

The Centre of Excellence on Occupational Health and Safety (CoE-OHS), through technical support from AUDA-NEPAD and partners, developed an ILO-ICRP curriculum. The curriculum aims to provide a stepwise approach and simple, reproducible training in systematically describing and recording radiographic abnormalities, provoked by the inhalation of dust. The approach follows the standardised reading of chest X-rays for silicosis. The first training will be held in Kitwe, Zambia, where the CoE will host trainees from Malawi.

The Centre has upgraded its ICT infrastructure and installed an Extension for Community Healthcare Outcomes (ECHO) platform, which links hospitals to the OHS specialist physicians for X-ray interpretations and clinical meetings. The CoE, with technical support from AUDA-NEPAD, established the Regional Experts Advisory Panel (REAP), the details of which are published elsewhere.

Alignment with other regional projects on TB and OLDS

The Government of Zimbabwe is implementing an artisanal small-scale mining TB and silicosis project, titled the Kunda-NqobiTB project, which is funded by the USAID. The project focuses on eight priority districts with high artisanal mining activities, high TB disease burden, and poor TB treatment outcomes. To date, more than 500 officers have been trained within the project on the ILO-ICRP including occupational health nurses, environmental health practitioners, and district TB officers. The results of the project show a high prevalence of TB, silicosis, and HIV among ASMs at two occupational health clinics. Sixty-four of 2473 ASMs screened through outreach campaigns (2.6%) were diagnosed with TB, and 393 (15.9%) with silicosis.

Progress on OHS policy reforms (policies, laws, regulations and guidelines) and sharing of best practices

The sustainability of all the regional investments in eradicating silicosis, TB and other OLDS hinges on a comprehensive OHS legal framework. It was acknowledged that some laws are outdated, fragmented, unenforceable, and not aligned with international best practices and standards. Member states have successfully reviewed and developed relevant Acts and Regulations. Countries faced challenges due to protracted reform processes and procedures in passing the revised laws. The delay in progress has negatively impacted OHS service delivery. AUDA-NEPAD will engage key stakeholders, including parliamentarians and policy makers, to facilitate the quick review and approval of legislation.

The Government of South Africa has been exceptional with regard to legal reforms as it successfully developed and revised its OHS laws. The Department of Employment and Labour has developed and, or revised the following Regulations under the Occupational Health and Safety Act: Ergonomics; Facilities; Hazardous Biological Agents; Asbestos Abatement; Lift Escalators and Passenger Conveyors; Electrical Installation; Electrical Machinery; Pressure Equipment; Commercial Dividing; General Administrative; General Safety; Health and Safety of Children at Work; Construction; and Driven Machinery. The Department is revising the Environmental Regulations for Workplaces Regulations and the Noise-Induced Hearing Loss Regulations.

AU-Occupational safety and health information system

Problems related to the information management system continue to affect the project and need to be resolved. AUDA-NEPAD is engaging with stakeholders (country, regional and global) to develop an information system that will generate the data needed to inform policy. The Cross Border Referral System (CBRS) is a tool developed, under the TiMS project, for the management of patients across borders. Personnel in the participating countries have been trained on its use. Personnel from Eswatini, Lesotho, Mozambique, and Zimbabwe were trained in November 2020, while those from Botswana, Namibia, South Africa, and Zambia were trained in May 2021. The IOM informed the meeting on data management for occupational health screening, as well as TB/HIV outreach services, for Mozambican miners and migrant workers working in South Africa; screening is now mandatory.

CONCLUSION

The CoP-OHS is a critical technical working group aimed at harmonising and collating all regional occupational TB and OHS activities. It provides a platform for countries to share lessons learned and best practices. The meeting focused on public sector initiatives; however, there is a need to include private sector initiatives such as the Minerals Council South Africa’s Masoyise ITB and Women in Mining (WiMSA) projects, and the Mine Health and Safety Council’s Centre of Excellence.

ACKNOWLEDGEMENTS

The World Bank funds the SATBHSS project: P155658 and P173228. For more information, visit www.satbhss.org and www.nepad.org. AUDA-NEPAD also acknowledges the members of the community of practice on OHS, ILO, IMO, WHO, and SADC member states for their contributions.

REFERENCES

Occupational health and safety challenges in workplace improvement in Africa

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Africa is documented as the region with the largest youth population; almost 60% of the population is younger than 25 years. This should be of benefit to the continent but many in this population group are not in education, employment or training (NEET). In the midst of these challenges, a number of youths who are fortunate enough to find employment feel threatened in their workplaces; a high level of workplace risk, without adequate safety procedures, is compounded by the absence of a social safety net.

While Africa has been at the centre of several global conversations on workplace safety and health improvement, these have not yielded significant results, due to lack of actionable commitment from stakeholders. Poor commitment to occupational health and safety (OHS) by leadership at regional, country, and enterprise levels is one of the challenges facing Africa. Heads of state have participated in several meetings where OHS was discussed, yet there have been no tangible results. These meetings include the World Health Organization-International Labour Organization (WHO-ILO) Joint Efforts on Occupational Health and Safety in Africa held in March 2001 in Harare, Zimbabwe; the Ouagadougou Convention of all African leaders held in Burkina Faso in 2004; and the Review of Occupational Health and Safety in Africa held in Benin Republic in 2005. This lack of commitment has adversely affected both the growth of the workplace health and safety profession, and the implementation of health and safety interventions in African workplaces.

The African region is characterised by inadequate or non-existent workplace health and safety legislation and regulations. There is a limit to what can be achieved without these. The 2019 OSHAfrica Conference (Johannesburg, South Africa) highlighted lack of legislation as a key limitation to workplace health and safety growth in Africa. OSHAfrica announced its ongoing efforts to review all existing legislation with the aim of working with the African Union for a One-Africa Workplace Health and Safety Protocol. This project was significantly hampered by the COVID-19 pandemic but efforts are back on course, with legislation in more than 40 countries already reviewed. The legislation in several African countries was found to be obsolete and ineffective for the protection of worker health and safety. Such legislation needs to be amended to make it relevant to the current realities within each sovereign state.

Another issue of concern is the launch of the African Confederation Free Trade Agreement (AfCFTA) in May 2019 in a region with inadequate legal frameworks for workplace health and safety governance and regulation. This Agreement enables, for example, a Nigerian to freely trade in Gabon or Zambia, or a Kenyan to freely trade in Egypt or Cameroon. However, there is no unified regional health and safety legislative framework that covers such workers. We need to rethink this process.

The amount of funding that OHS attracts in Africa is unknown. We can assume that it is grossly underfunded, based on the quality and outcomes of work done by government agencies across the continent. The Abuja Declaration of 2001 mandated all African heads of state to increase their national healthcare budgets to 15%. Nineteen years later, only South Africa and Rwanda have fulfilled their commitments. The current state of healthcare in many countries suggests that workplace OHS continues to be underfunded in Africa, which has handicapped regulatory government agencies. Of note is the insufficient number of workplace health and safety inspectors across the continent, leading to inadequate inspection coverage. In most countries, some workplaces have not been inspected in more than five years, making it difficult to know if these workplaces are adhering to OHS regulations. Other challenges include inadequate inspector training and lack of resources to perform inspections.

The implementation of safe OHS processes is also hindered by the inadequate number of institutions providing health and safety training and standardisation of training. Some individuals have managed to access education in the West, which is prohibitively expensive for most families. Consequently, there are very few qualified OHS practitioners in Africa; many learn on the job, which is unsafe.

When a standard is not set, everything you see will look like a standard. The region needs to have defined standard training requirements. For example, what constitutes standard first aid training, what constitutes standard risk assessment training, what is the standard content that should be included in training modules, and how many learning hours are adequate? Currently, we do not have such standards in Africa, and training programmes apply whatever standards they deem fit. Hence, there is lack of coherence in workplace health and safety practice. Some training certificates have been rejected in other countries because the training was deemed to be substandard. What, though, is the standard and what certificates should be issued? Training programmes need to be well defined and standardised across the continent. If we do this, opportunities for institutions of learning to develop health and safety programmes will be created.

In addition to inadequate and, often, obsolete OHS legislation, where law does exist enforcement is poor. Health and safety inspectors, from national ministries responsible for labour, are responsible for enforcement, but they are either too few in number or not properly trained on their roles, making enforcement difficult. Many inspectors have qualifications that are not related to OHS, but get little or no on-the-job training and, consequently, do not have the requisite knowledge and skills to conduct effective inspections. The poor research capabilities of African OHS practitioners is another challenge. We need to scale up research capabilities in this field. While some research is done, improvement is required and more scientific
manuscripts need to be published in accredited, peer-reviewed journals, such as *Occupational Health Southern Africa*. Research helps to identify problems and provides evidence to support the development of interventions to address the challenges. Practitioners should be trained in research methods and writing funding proposals. With this local expertise, Africa will be able to develop the capacity to identify health and safety challenges and provide solutions, instead of waiting for experts from the West to do the research.

The National Institute for Occupational Health (NIOH) in South Africa is an ILO- and WHO-collaborating centre in Africa. This is good, but there is an urgent need to set up smaller research centres across all four subregions of Africa. These subregional centres, being close to health and safety issues, could conduct research locally, leaving the NIOH to assume the role of a flagship African occupational health research centre. All the research conducted in the smaller centres could be sent to the NIOH, which would maintain a regional repository of OHS resources for the continent.

While there are many OHS challenges in Africa, including the implementation of improvements in workplaces, these problems can be addressed if approached in a structured manner, with honesty and commitment from all stakeholders, and with mindful use of the available resources and expertise. If we achieve this, at the very least, employees’ families will be assured that their loved ones work under safe conditions and will return home, healthy and uninjured, at the end of the day.

**REFERENCES**

The Occupational Hygiene Society of Ireland (OHSI) and the British Occupational Hygiene Society (BOHS) are privileged to jointly host this conference and to contribute to its successful outcome.

The conference theme has been confirmed as - ‘Protecting workers from health hazards: Advancing in this changing world’.

The conference aims to promote occupational hygiene and worker health protection by the minimisation of worker exposure to hazardous agents globally through plenary sessions, keynote lectures, parallel talks, workshops, poster presentations and professional development as well as networking opportunities and social functions.

A strong Global media campaign will publicise the main causes of occupational disease throughout the conference.

More information including venue, dates and abstract submission arrangements will be announced very soon. Please mark your diaries for June 2024 in Dublin, Ireland!
Updates of IOHA associations and activities with the International Labour Organization

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Over the past few years, the International Occupational Hygiene Association (IOHA) Stakeholders Relations Committee and members of the Executive Committee have worked hard to build bridges with the International Labour Organization (ILO). In 2016, Nancy Leppink (Chief of Labour Administration, Labour Inspection and Occupational Safety and Health Branch (LABAD/minOSH)) attended the IOHA Board meeting; in 2018 she was the keynote speaker at the IOHA Triennial Conference in Washington, D.C., United States. IOHA members have recently worked on think pieces to support the ILO 100/World Health Day (Manal Azzi, Norhazlina Mydin, Chris Laszcz-Davis), written and reviewed guidance documents on biological and chemical agents (Frank Muchiri, Christian Schumacher, Remko Houba, Andrea Hiddinga, Thomas Fuller), and assisted the ILO on specific regional research projects, such as the cotton/textile industry hazard assessment in Madagascar (Andres Winkes, Andrea Hiddinga).

Since 2020, Thomas Fuller has represented IOHA on the ILO Global Coalition for Safety and Health at Work Task Group on Vision Zero at the Enterprise Level, and the Task Group for Promoting Decent Work and Productive Employment through Higher Education. This project brings together educators from around the world to work on a variety of research projects, looking at the role that education can play in improving worker health and safety, globally.

In May of this year, Rene Leblanc and Thomas Fuller each co-chaired different sessions of the ILO Vision Zero Summit held virtually and hosted by Japan. Rene co-chaired a session and spoke at a session on Health/Hygiene/COVID-19, and Thomas co-chaired and presented a paper on a session on Education/E-learning/Credentialing. As a result of our participation at the event, IOHA was one of five international organisations invited to sign the Tokyo Declaration on Vision Zero for All, Japan 2022.

More recently, on 8 June 2022, IOHA President, Norhazlina Mydin, addressed the plenary session of the 110th International Labour Conference, (ILC) of the ILO. This is a fantastic honour and represents the culmination of many years of hard work by our members in putting the good face and name of IOHA forward on so many ILO collaborations and projects. The following is the statement made by Lina, virtually, to the Conference:

Dear President, distinguished delegates, guests, observers, ladies and gentlemen. Firstly, thank you for giving the International Occupational Hygiene Association (IOHA) the opportunity to speak at this Plenary of the 110th ILC. IOHA, representing 18 000 members and 8 200 professional occupational hygienists from 35 countries, is truly excited to be part of the journey for the amendment of the 1998 Declaration: Fundamental Principles and Rights at Work. Recognition of health and safety as a fundamental human right is only the beginning of an exciting journey ahead of us. IOHA believes this will drive three focused areas, namely:
1. Strengthened regulatory framework
2. Enhanced capability building
3. Greater partnership nurtured

Strengthened regulatory framework
Director General Guy Rhyder, in his speech (https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_846791/lang--en/index.htm), mentioned that three million lives are lost each year because of work-related accidents and diseases. He stressed the ‘stark and clear’ responsibility of the ILO to protect workers against sickness, disease and injury arising from employment. This demonstrates the urgent need to review and strengthen the legal instrument to provide minimum requirements to protect workers in their working environment. At the time that businesses are recovering from the impact of COVID-19, economic viability will be a bigger priority for some, over the investments that protect workers’ safety, health and wellbeing. Stronger regulations and enforcement, as a result of the adaptation of health and safety as a fundamental right, will drive the compliance culture.

Enhanced capability building
IOHA recognise the concerted effort to enhance capability building, especially in the areas of occupational hygiene, for various stakeholders. It is not only for the regulatory bodies, but also for professional safety and health organisations, researchers, social security institutions, workers, and students, who are desperately needed to support the larger companies and SMEs for implementation of measures to assure safe and healthy working conditions.

Access to trainings is now easier than before with e-learning modules, and some are even offered pro bono. Aligned with technological enhancement, research to further improve workers’ health and safety should also focus on developing economies, where a lot more industrialisation is taking place. The aspect of local culture should be taken into consideration to ensure an effective strategy and holistic mindset for prevention, which is built on the common desire to promote and establish a global prevention culture.
**GLOBAL EXPOSURE MANAGER**

Greater partnership nurtured

In IOHA, our mission is to enhance the international network of occupational hygiene organisations that promote, develop, and improve occupational hygiene worldwide, providing a safe and healthy working environment for all. With the recognition of health and safety as a fundamental human right, we are even clearer about our contribution to the United Nations Sustainable Development Goals (SDGs), in particular SDG 8 (Decent Work and Economic Growth), SDG 3 (Good Health and Wellbeing), SDG 4 (Quality Education), and SDG 17 (Partnerships for the Goals). The Tokyo Declaration on Vision Zero for All 2022 is another testament for greater partnership across the globe.

In conclusion, access to safe and healthy working environments is not optional, it is the fundamental right of the 3.3 billion workforces, globally. It is the right thing to do.

Thank you very much.

Norhazlina Mydin, CIH, CPIH, CSFC
President, IOHA

Workplace Health Without Borders and Wolaita Sodo University flexibility and international capacity building project

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A chance meeting, at the 2017 National Institute for Occupational Safety and Health (NIOSH) USE Conference in Denver, USA, between Workplace Health Without Borders-US (WHWB-US) former President, Dr Albert Tien, and the former Vice-President of Wolaita Sodo University (WSU) in Ethiopia, Dr Yesuneh Chernet, DVM, has led to a memorandum of understanding (MoU) between WHWB-US and the University. The goal of the MoU is to establish capacity-building joint research programmes and professional exchanges in occupational health and safety (OHS). WHWB-US has embarked on a five-year project to assist WSU. The University was established in 2007 and is a non-profit public higher education institution. WSU has branch campuses in Bodity, Areka, Humbo, Otona, and Tercha. It is officially accredited by the Ethiopian Ministry of Education and has an enrollment of approximately 35,000 students.

Several meetings have been held with WSU leadership to formulate short- and long-term goals and areas of co-operation. The project leader, Dr Albert Tien, developed a strategic five-year plan for the University, which includes capacity-building programmes in the areas of work-related health and safety issues; organising symposia, conferences and meetings on research issues related to work-related health and safety issues, promoting interest in reducing occupationally related injuries and diseases among underserved workers, their families, and their communities at large; and seeking possibilities for joint research projects. The project has been awarded a grant by the American Industrial Hygiene Association (AIHA) International Affairs Committee, Emerging Economy Microgrant Program. Project participants are grateful for this support and are looking for additional funding.

The Pandemic’s travel and visa restrictions threw a wrench into plans to bring the WSU leadership delegation for in-person meetings and training at Ann Arbor, Michigan. To maintain the momentum, a series of online virtual presentations and trainings were developed by the WHWB-US team and partner organisations such as AIHA, Michigan Occupational Safety and Health Administration (MIOSHA), the Occupational Hygiene Training Association (OHTA), and the University of Michigan. Virtual symposia began on 25 March 2022 and continued through to 17 June 2022. WHWB is planning to host the WSU leadership delegation in Ann Arbor next year, and therefore WHWB-US is seeking further funding to cover the costs of hosting the delegation.

WHWB-US is a 501(c)(3) public charity whose mission is to ensure that workers and employers have the knowledge and means to prevent work-related illness and injury. The organisation is composed of occupational health professionals, and other concerned individuals, whose mandate is to share technical skills and training. This mandate includes providing the financial means to help underserved worker populations, throughout the world, to identify and manage OHS risks. The goal is to develop the knowledge and creative capacity in these worker populations to assess and mitigate the risks of occupational hazards in their workplaces, as well as where those hazards may impact their communities at large. To contact WHWB, please mail WHWB-US at 1100 N Main Street Suite 001, Ann Arbor, MI 48104, USA, or e-mail whwbusr@whwb-us.org.
History and status of the Argentinian Occupational Health and Safety Administration

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Argentina was a pioneer among United Nations (UN) member countries when they sanctioned their first Occupational Health and Safety (OHS) Standards law 19587 in 1972. Fifty years of existence of the law was marked on 21 April 2022. During this time, the field of OHS in Argentina has grown significantly, aided by a variety of educational programmes offered by colleges and universities. Graduates of these programmes work to support the health and safety of workers in a variety of organisations and industries.

In 1995, Occupational Risks Law 24557 was created to provide additional worker protection. It was called ‘Insurers of Risk at Work’ (ART, Aseguradora de Riesgo del Trabajo), known in other countries as ‘Mutuas’. The principal aims of the Insurers are to work together with companies in matters of safety prevention, providing them with technical assistance, and to assist with damages related to work activity (covering accidents at work sites, in itiner, and occupational diseases).

Simultaneously, the OHS Public Administration is managed by the Superintendence of Occupational Risks (SRT), who issues and updates the regulations on this field. The SRT also audits the insurance companies (ARTs) and employers through the Local Labour Administrations, covering OHS issues throughout the country. All the above-mentioned programmes and organisations make up the Argentine Occupational Risks System. Prior to this, the only compensation for injured workers in Argentina was for funeral expenses.

After the publication of the Occupational Risk Law, various regulations were issued in pursuit of risk prevention. Argentina has three highlighted regulatory items:
- Decree 351/79: industrial workplaces
- Decree 911/96: construction workplaces
- Decree 617/97: agriculture and cattle-raising workplaces

In order to comply with the International Labour Organization (ILO) Convention 139/77, in 2000 Argentina created its Record of Companies that use Carcinogenic Substances. Although it has been updated over the years, an important modification was sanctioned in 2019, which lead to an improvement in the data quality, forcing employers to keep medical records for a period of 40 years. Consequently, this has enabled better control and follow up of occupational disease cases.

Another milestone in Argentinian OHS Law was Resolution 295/2003, which conducted a technical update for exposure limits, following the main international guides and best practices for OHS hazards. Above all, it added ergonomic risk to the system, whose pathologies occupy, in Argentina’s OHS Administration, a place in the top three most-commonly occurring occupational diseases. This amendment was updated by Resolution 886/2015, which forces all companies to have an ergonomic assessment of workplaces, validated by an interdisciplinary team.

Currently, the Argentine Occupational Risks System, after more than 25 years of experience, provides coverage to more than 9 930 000 workers and 1 020 000 employers. In conclusion, it has managed to reduce fatalities at work by 80%, which can be translated into 14 000 lives that have been saved.

REFERENCE
The role of industrial hygiene in 4.0 industries

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The American Industrial Hygiene Association (AIHA) defines industrial hygiene as the science and art of anticipating, recognising, evaluating, controlling and confirming existing health hazards in work environments. Although the prevention of occupational disease continues to be the main driver in this field, the disruptive changes that today’s society is experiencing present new challenges and opportunities that must be taken into consideration. In this sense, both the digital transformation and the evolution of the concept of corporate sustainability play a fundamental role. In the first instance, it should be kept in mind that exposure assessment is a core part of industrial hygiene. This exposure assessment is carried out through the articulation of different elements that are combined in a Plan-Do-Check-Act cycle of continuous improvement (from diagnosis to control). In turn, digital transformation has taken a predominant role in terms of how companies apply digital capabilities to their processes and services to improve efficiency, manage risk, and leverage new revenue-generating opportunities. In this sense, the assessment of exposure can take advantage of the interconnection of measurement equipment under real-time web platforms to enhance hygiene risk management. Monitoring networks are installed at different points in the company, generating 24/7 coverage of different physical agents. In addition, these systems can be used to identify the need for additional studies in the most critical areas or in those areas with the greatest variations in exposure.

Nevertheless, the volume, interdependence and analysis of this information demands an adequate technological infrastructure and presents additional challenges that must be resolved under a global company scheme. As a second aspect, the concept of business sustainability has evolved in recent decades towards a holistic vision that articulates three elements, viz. environmental, social, and economic sustainability. Based on that, areas of a company must be aligned to the strategic planning and generate real value in favour of a holistic sustainability. Industrial hygiene, as a transversal science that interacts with different dependencies of the company (production, maintenance, supply, medicine, legal department, and environmental, among others), has the challenge, and responsibility, of improving its integration to enhance the generation of corporate value.

It is important to emphasise that the required interaction between areas of a company presents a highly complex challenge for managers. The analysis of results by those who make decisions in a company requires knowledge of these interactions to identify strengths and opportunities for improvement. Therefore, hygiene management should be oriented not only towards the prevention of occupational illnesses, but also towards the construction of traceable information that can be used strategically by other company departments. Based on a corporate business intelligence model, industrial hygiene activities can provide another useful dataset in support of the entire information structure. Data quality concepts related to integrity, homogeneity, and granularity are relevant in this regard and must be considered throughout the hygiene process. Finally, the implementation of artificial intelligence algorithms, applied to data analytics, is a field of wide development and adoption. In hygiene, the use and analysis of information to profile similarities (e.g. similar exposure groups (SEGs)) or predict future scenarios (exposure variation over time) are being adopted as management support.
Workplace vaccination policies: employers’ individual circumstances and proper procedures are still paramount

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Recent apparently contradictory rulings from the Commission for Conciliation, Mediation and Arbitration (CCMA) on whether employers can fairly dismiss employees who refuse to be vaccinated against the COVID-19 virus have caused some confusion in the labour market. Yet in our view, one thing is clear: the decision to introduce a vaccination policy remains one that must be based on each individual employer's circumstances, as set out in its risk assessment and as informed by the prevailing medical science. This principle, coupled with the imperative to follow proper consultation procedures, still holds.

This should offer some comfort to employers wondering where they stand after a recent CCMA ruling in favour of an employee who had been retrenched after refusing to comply with her employer's vaccination policy. In this case between Kgomotso Tshatshu and Baroque Medical (Pty) Ltd, the employer had framed vaccination as an operational requirement to reduce the time employees spent away from work due to illness and ensure a safe working environment. The policy required all employees to be vaccinated, failing which their services “may then be terminated for operational reasons”. There were no alternative positions or roles that did not require vaccination and four employees were ultimately retrenched.

The employee in this case, a senior inventory controller, had refused to be vaccinated because of her fear of the vaccination, having experienced a previous negative response to a flu vaccine 10 years earlier. She also objected on Constitutional grounds, namely her right to bodily integrity, stating that the vaccine was experimental. The employer required her to substantiate her refusal on medical grounds, but ultimately rejected the doctors’ notes she presented as being insufficient. Having rejected her grounds for refusing to vaccinate, the employer dismissed the employee without severance pay.

Risk assessment was lacking and consultation cursory

The matter went to the CCMA, where the Commissioner ruled that mandatory vaccination policies were not only unreasonable but also had “no place in our labour market”. He awarded the employee the maximum compensation, equivalent to 12 months’ remuneration.

No cause for alarm

Many who have voiced their opposition to workplace vaccination policies may welcome the decision, but employers who have such policies in place need not necessarily be alarmed.

The decision is only one of many to have come out of the CCMA recently and does not create binding precedent. Where the employer in this case appears to have fallen short is in failing to produce a risk assessment to substantiate its vaccination policy. It is clear from the applicable regulations that any employer's vaccination rule must be informed by its risk assessment and the particular hazards and working conditions that arise in its specific workplace. Further, when it comes to the dismissal of an employee for failing or refusing to comply with an employer's vaccination policy, employers will need to be able to show that the proper procedures were followed – both in introducing the policy and in exploring alternatives and reasonable accommodation measures. As is always the case, dismissal remains an act of last resort.

Taking issue with some of the findings

While the ultimate outcome reached on the fairness of the employee’s dismissal may be reasonable in the circumstances of the case, a number of issues can be raised over the Commissioner’s findings. For example, in relying directly on the Constitution, the Commissioner’s reasoning failed to appreciate the principle of subsidiarity and the fact that there is existing legislation which creates the legal framework for vaccination policies in the workplace. In particular, the Commissioner failed to consider the employer’s duty, in terms of the Occupational Health and Safety Act, to create and maintain, as far as reasonably practicable, a safe and healthy working environment. The Commissioner also failed to consider the Hazardous Biological Agents Regulations and the Code of Practice on Managing Exposure to SARS-Cov-2 in the Workplace, which further inform this general duty.

In conclusion, while the Commissioner in this case has undoubtedly made his views clear on workplace vaccination policies, the sweeping statements made about such policies in general should not be taken as the final pronouncement on the issue. Any decision to introduce a vaccination policy remains one that must be based on each individual employer’s circumstances and adherence to proper procedure.
Asbestos Abatement Regulations, 2020 promulgated under the Occupational Health and Safety Act No. 85 of 1993 (as amended)

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Exposure to asbestos dust has long since been known as an occupational risk; however, it is often overlooked because of the difficulty in identifying asbestos ‘in place’ and the long latency period before symptoms or diseases present in exposed persons. Asbestos in place is defined in the Regulations as any asbestos, asbestos cement products, asbestos coatings, asbestos-containing material, asbestos dust, asbestos insulation, asbestos insulation board and asbestos waste at the workplace.

South Africa began mining asbestos around 1883, after a crocidolite mine was established in the Northern Cape region, in Koegas. The country developed into a major producer of crocidolite, supplying Australia and the United Kingdom, for many years, with the (then) sought-after heat-resistant mineral. South Africa’s mining of asbestos peaked in 1977, when it was the third-largest supplier in the world. Within a decade, however, the Northern Cape mines were closed due to the related health risks and a growing concern over litigation against mining companies.

In 2001, the (then) Department of Labour promulgated the Asbestos Regulations under the Occupational Health and Safety Act No. 85 of 1993. These Regulations directed how asbestos needed to be controlled in a work environment to limit and control exposure to employees. At this time, South Africa was still manufacturing materials containing asbestos, such as water pipes, roof sheets and insulation rope. In 2008, the (then) Department of Environmental Affairs promulgated the Regulations for Prohibition of the Use, Manufacture, Import and Export of Asbestos and Asbestos Containing Material. This resulted in the cessation of the manufacturing of asbestos-containing materials in the country. However, many buildings built between the 1940s and 1980s still contain materials that contain asbestos.

The Department of Employment and Labour established a Technical Committee to review the Asbestos Regulations (2001) in 2014. The Committee comprised representatives from organised business, organised labour and Government, and technical specialists in the field. The work of the Technical Committee culminated in the promulgation of the Asbestos Abatement Regulations in November 2020 after approval from the Advisory Council of the Minister for Occupational Health and Safety (ACOHS) and the Minister of Employment and Labour.

The Asbestos Abatement Regulations focus on asbestos in place as no new asbestos products may be produced or imported, as well as the elimination of health risks associated with asbestos exposure. The Regulations require an employer to identify all asbestos-containing building materials. A written inventory of all asbestos building materials should be drawn up and regularly reviewed by the employer. Where the employer is not the owner of the building or facilities used by him/her, an agreement should be reached with the building owner, as the employer is accountable for assessing the risk to his/her employees at that place of work. Once an inventory of asbestos building materials is available, a management plan should be developed for maintaining and/or removing asbestos-containing building materials. A transition period provided for in the Regulations allowed time for employers to develop these management plans after the Regulations were gazetted in November 2020. The transition period of 18 months came to an end in the middle of May 2022.

The Regulations also changed the approach to registered asbestos contractors, dividing asbestos work into three types:

Type 1 asbestos work is the painting of asbestos cement products in a manner that does not require surface preparation and does not cause the release of asbestos fibres; or the removal of < 10 m² of asbestos cement products, or equivalent gutters and piping, or asbestos insulating board, where removal work may not be repeated on the same site within a period of six months; and does not require registration as an asbestos contractor with the Chief Inspector of the Department of Employment and Labour.

Type 2 asbestos work is the repair or encapsulation of asbestos cement products in a manner that does not require surface preparation, or the removal of asbestos cement products or asbestos insulating boards.

Type 3 asbestos work is the removal, repair or encapsulation of any asbestos and asbestos-containing materials. Both asbestos and asbestos-containing material are defined in the Regulations. Companies performing type 2 and/or type 3 asbestos work require registration as asbestos contractors with the Chief Inspector of the Department of Employment and Labour. Registration is valid for a three-year period and companies are provided with a registration certificate with a unique reference number.

The risks associated with performing type 1 asbestos work are considered to be negligible ONLY if there is adherence to the restrictions for volume, frequency and type of material. The intent of type 1 asbestos work is to allow for once-off small asbestos removals to be conducted by building owners themselves, without incurring exorbitant costs; a plan of work does not need to be submitted to the Department of Employment and Labour. However, a written safe operating procedure that includes the disposal of waste needs to be developed and adhered to at all times, and the Department should be notified of such work before commencement.

The criteria that provide guidance for the preparation of an application to register for type 2 and type 3 asbestos work are available on the Department’s webpage under (https://www.labour.gov.za/DocumentCenter/Pages/Forms.aspx). An up-to-date list of registered asbestos contractors is available from the Department. This is useful for verifying that a company has a valid registration certificate.
While asbestos demolition was a main focus of the old Regulations and allowed for registered asbestos contractors to perform this work, asbestos demolition is prohibited under the new 2020 Regulations. Demolition work is defined as a method to dismantle, wreck, break, pull down or knock down a structure, or part thereof, by way of manual, machinery, or the use of explosives in line with the Construction Regulations of 2014. All asbestos-containing materials must be safely removed for disposal before any demolition may start on a building.

The Regulations gazetted in November 2020 allowed for an 18-month transition period for the identification of asbestos in place in all buildings and the development of asbestos inventories and asbestos management plans. The management plan should contain, for example, a description of the asbestos or asbestos-containing material; the location, quantity, and state of deterioration; labelling that is in place; and the planned maintenance activities for the following years until final removal and disposal. The timeframe for final disposal is not prescribed and should be based on the risk and unique circumstances of each building.

There is no cut-off date by which all asbestos building materials will have to be removed (banned). There is, however, a National Asbestos Management Strategy that aims for an asbestos risk-free South Africa by 2030. The reason for there being no ‘cut-off’ date for the removal of all asbestos-containing building materials is that many buildings in South Africa still contain asbestos. If these asbestos materials are kept in a good state of repair (not broken or damaged) they can safely remain in place for many years, with no risk to health. The cost of safely removing and disposing of asbestos and asbestos-containing materials is high and may be disproportioned to the risk, should a ‘cut-off’ or ban be instituted. In addition, the cost of disposal of asbestos waste at hazardous waste landfill sites can be expensive, and disposal reduces the lifetimes of the sites when large quantities of contaminated building materials are added to them. Every maintenance plan for asbestos in place must include the phase-out of all asbestos and asbestos-containing material, within a self-selected timeframe.

The 2020 Asbestos Abatement Regulations stipulate specific requirements for the major role players in the removal of asbestos or asbestos-containing material. Responsibilities are assigned to the client, the registered asbestos contractor, and the approved inspection authority (AIA). The asbestos client, being an employer, cannot simply hand over an asbestos removal project to the registered asbestos contractor; the employer remains accountable.

Although established as ‘good practice’ in the past and provided by many AIAs, a ‘dispensing of asbestos clearance certificate’ is now required for the final closure of an asbestos project. Requirements for certifying that an area or building is ‘clear’, after an asbestos project, include visual inspections and environmental air sampling compared to the clearance indicator of 0.01 fibres per millilitre of air. A change has been introduced regarding the time period for safe keeping of records, from 40 to 50 years, mainly due to research, which has shown that the latency period of asbestos-related disease can be up to 50 years after exposure.

On 20 May 2022, the Minister of Employment and Labour gazetted an amendment to the Asbestos Abatement Regulations of 2020. Three changes were made to the Regulations that impact their implementation. First, clarity is provided that the occupational exposure limit (OEL) for asbestos is related to a four-hour sampling time. To this purpose, a short section was added to the definition: ‘OEL for asbestos’ means an occupational exposure limit of 0.1 regulated asbestos fibres per millilitre of air over a continuous period of four hours, measured in accordance with the Health and Safety Executive’s analysts’ guide for sampling, analysis and clearance procedures for asbestos. Second, some text was deleted from Regulation 7(4)(a) in order to clarify who can deem a person competent. The intention is not for the Chief Inspector, Occupational Health and Safety to ‘declare’ persons competent, but for everyone following the definition of a competent person to come to the same conclusion regarding a person’s competency to perform a task, as required in the Regulations. Last, Regulation 13(e) has been deleted; it is no longer the responsibility of an AIA to obtain acknowledgement from the Chief Director, Provincial Operations for notification of type 2 and type 3 asbestos work. This is an important change to keep in mind during SANAS audits of AIAs.

REFERENCES

ICOH2024 Congress – Save the date!

Claudina Nogueira: Occupational health consultant/project manager, University of Pretoria, South Africa; SASOM ExCo member; ICOH Vice President: Scientific Committees (2018–2024); WHWB Board member
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The work has officially begun for the next congress of the International Commission on Occupational Health (ICOH) – the 34th International Congress on Occupational Health (ICOH2024 Congress). The first face-to-face planning meeting for the ICOH2024 Congress was held between ICOH officers and members of the Secretariat (onsite and online) and members of the Moroccan local Congress organisers, including the ICOH2024 Congress President, Prof. Abdeljalil El Kholti, in Marrakesh, on 27 and 28 June 2022. Discussion points included Congress logistics, scientific programme, content for the announcements, the constitution of the various Congress committees, key deadlines, and the official Congress website. The meeting included an audience and question-and-answer session with the conference centre management and a virtual tour of the venue. The ICOH officers took this opportunity to hold their officers’ meeting prior to the meeting with the local Congress organisers.

The ICOH2024 Congress will be held in Marrakesh, Morocco, from 28 April to 3 May 2024, at the Movenpick Palais des Congrès, with the theme, *Enhancing Occupational Health Research and Practices: Closing the Gaps!* The Congress will be hosted by the Moroccan Occupational Health Association (MOHA) and the Occupational Health Unit of the Faculty of Medicine and Pharmacy of University Hassan II of Casablanca, in collaboration with ICOH.

Marrakesh is one of the most visited and popular cities in Morocco. Although Marrakesh is not the capital (Rabat), largest (Casablanca), or oldest (Fes) city in Morocco, it is certainly the country’s most intriguing one and the cultural capital. Its famous sights, which include historic medinas (old parts of the city) and ornate palaces, bustling traditional marketplaces (‘souks’), and labyrinthine alleyways, have given the city this designation. Known as ‘The Pearl of the South’ and ‘The Red City’, Marrakesh offers visitors the perfect blend of a rich culture, delicious cuisine, historic wonders, unique scenery, famous traditional Arabic architecture, and a myriad of places of interest.

Please access the official Congress website to register your interest for the ICOH2024 Congress (click on the ‘Interest’ button in the menu at the top of the website) and subscribe to the Congress newsletter to receive updated information as it becomes available (https://www.icoh2024.ma/).

SASOM National Office

The Department of Employment and Labour (DoEL) has circulated, for review, the ‘Requirements for Registration as an Occupational Health Service Provider (OHSP)’ with the main aim of developing a databank and standardising the recognition of OHSPs. The document was developed before the COVID-19 lockdown by the sister organisations in occupational health that are part of the DoEL Forum – the South African Society of Occupational Medicine (SASOM), the South...
Use of the official ICOH2024 Congress logo and promotional material: courtesy of the ICOH2024 Congress Local Organising Committee, Marrakesh, Morocco

Use of the ICOH logo: courtesy of the ICOH Secretary General, Rome, Italy

Prepare to be a-maze-d – The Marrakesh medina (old part of the city) is famous for its souks (marketplaces), winding alleyways, mosques, traditional houses, peaceful inner courtyards, a tangle of tunnels, and hidden treasures down dead-end streets. It is enclosed by 19 kilometres of pink walls built circa 1122
Photograph: Dr Diana Gagliardi, ICOH Secretary General, Rome, Italy

Hats off to traditional crafts – The sights and sounds of Marrakesh were evident at a street market selling hats, baskets, and other woven goods
Photograph: Dr Diana Gagliardi, ICOH Secretary General, Rome, Italy
African Society of Occupational Health Nursing Practitioners (SASOHN), and the Southern African Institute for Occupational Hygiene (SAIOH). The National Institute for Occupational Health (NIOH), as the ‘service facilitator’, edited the final draft for review and comments from the three societies; this process is underway.

Prof. Daan Kocks, Chair of SASOM, attended the most recent meeting of the Editorial Board of Occupational Health Southern Africa (OHSA). One of the points of discussion was the declining income for the journal over a number of years. The yearly membership fees for occupational health and safety professionals to belong to SASOM, SASOHN, SAIOH, or the Mine Medical Professionals Association (MMPA) include a subscription to OHSA (six issues per year). Even though the costs associated with the journal have increased over the past few years, SASOM remains of the opinion that the journal is an occupational health asset for members of the four aforementioned societies and for southern Africa, more broadly. SASOM continues to support the publication of the journal and will endeavour to contribute in any feasible way that will facilitate the sustainability of OHSA.

SASOM Annual Congress 2022 – A virtual event in four sessions

After not holding an annual congress in 2020 and 2021, due to the impact of the global COVID-19 pandemic, SASOM will hold its continuing professional development (CPD)-accredited virtual Annual Congress over four months in 2022 – on the last Fridays of the months of July, August and October, and on 16 September 2022 (13:00–17:00 South Africa Standard Time) – to offer its members four Congress sessions with individual themes, and four presentations in each session.

The programme for Session 1 – Updates on chemical exposures and medical surveillance, to be held on 29 July 2022, is as follows:
- Dr Haidee Williams (occupational medicine specialist and consultant, University of Cape Town (UCT), South Africa) – ‘Manufacture of vaccines: Process and toxicology’
- Anna Fourie (Immunology Section, NIOH, South Africa) – ‘Occupational skin exposures and the immune response in the COVID-19 era and beyond: Skin reactions to personal protective equipment (PPE) and hand hygiene measures’
- Dr Taneshka Kruger (senior researcher and project manager, Institute for Sustainable Malaria Control (ISMC), University of Pretoria (UP), South Africa) – ‘Understanding the malaria challenge: The UP ISMC’s perspective on attaining malaria elimination through transdisciplinary research, innovation, education, and capacity building’
- Dr Sashikala Chandrasekar (medical and occupational health consultant, Bangalore, India, and current Chair of the ICOH Scientific Committee on Rural Health) – ‘Pesticide issues and the need for action: A perspective from India’

The programme for Session 2 – Lessons learned from the COVID-19 pandemic, scheduled for 26 August 2022, is under development; three of the four invited speakers have agreed to present papers:
- Prof. Veronica Ueckermann (Department of Internal Medicine, UP, South Africa) – ‘Clinical aspects of ‘long COVID’: What can we expect and for how long?’
- Dr Herina Grobler (Life Health Solutions at Ford Motor Company, South Africa) – ‘Occupational health management programmes and corporate pandemic preparedness in the post-COVID era’
- Dr Gwen Brachman (retired medical and occupational health consultant, New Jersey, USA, and current Chair of the ICOH Scientific Committee on Occupational Health for Health Workers) – ‘The global shortage of health workers: The peril for our health systems’

SASOM representation at the SAMA Annual Conference

The South African Medical Association (SAMA) invited SASOM to participate in its Annual Conference and allocated a SASOM-dedicated two-hour session in its programme, for Saturday, 13 August 2022. The following SASOM members will present at the virtual SAMA Annual Conference, and represent the society:
- Dr Jan Lapere (medico-legal practitioner and advisor to SASOM) – ‘Occupational health for medical practitioners: Sick certification – rights and duties of the doctor’
- Dr Haidee Williams (occupational medicine specialist and consultant, University of Cape Town (UCT) – ‘Updates on medical surveillance in the workplace in the COVID-19 era’
- Dr Itumeleng Ntatamala (Chair of the SASOM Western Cape branch and occupational medicine specialist, UCT) – ‘Evaluating work ability and managing disability: A pragmatic approach’

Save the date to visit Marrakesh! – For only the second time in ICOH’s 118-year history, the ICOH Triennial Congress will be held in Africa. The ICOH2009 Congress was held in Cape Town, South Africa, in March 2009.
SASOHN academic workshop
Hosted by: SASOHN KZN Inland Region

Gillian Lotze
e-mail: gillian.lotze@mweb.co.za

INTRODUCTION
On 3 June 2022, the South African Society of Occupational Health Nursing Practitioners (SASOHN) KwaZulu-Natal (KZN) Inland Region presented a successful workshop to 43 delegates at the Maritzburg Golf Club, Pietermaritzburg. The event was well supported by sponsors and exhibitors, and included a line-up of highly experienced speakers who addressed a variety of relevant topics.

WELCOMING ADDRESS
The event was opened by Regional Chairperson, Gillian Lotze, who delivered a warm welcoming address:

Nurse – Just another word to describe a person strong enough to tolerate everything and soft enough to understand everyone

This workshop presents a unique opportunity for a variety of registered nurses to network, socialise and share their knowledge and experience, after two harrowing years of isolation.

The COVID-19 pandemic has shone a light on nurses on the frontlines of care in all sectors and highlighted our vital role as leaders in healthcare delivery. We have been asked to show up, step up and man up with courage, time and again – many of us operating alone – and it has been a lonely and sometimes scary journey. But, with every challenge comes an opportunity to grow, both personally and professionally, and I salute you for your resilience.

In a country of so much diversity and disparity, nurses are the universal gift to everyone; the dedicated work we do and the kindness we deliver, on a daily basis, serves as a reminder of the fundamental humanity inside us all.

SASOHN KZN Inland Region Executive Committee
Gillian Lotze: Chairperson
Tony Mthiyeni: Vice-Chairperson (and master of ceremonies)
Kathryn Olive: Educational Representative
Kim Arnold: Secretary
Penny Wheeler: Treasurer
Sandra Koekemoer: Public Relations Officer

I hope you leave here today with a bit more knowledge and that you feel connected, enriched, and inspired to continue your invaluable work of changing the lives of others, and making the world a better place.

PRESENTATIONS
The Regional Chairperson then introduced the first speaker, Dr Daniel Fiandeiro, an emergency medicine specialist who presented on ‘Emergency treatment in the workplace’. He spoke on a wide variety of emergency treatments, including anaphylaxis, multiple injuries, cardiac arrest, and effective continuous cardiopulmonary resuscitation (CPR).

The second speaker was the inimitable Dr Alistair Bull – a family medicine specialist who presented ‘The neurological assessment’ in a practical and straightforward way. Using Vice-chair Tony Mthiyeni as his prop, he demonstrated, using a YouTube clip, how nurses can comprehensively cover all the neurological screening tests in a medical examination.
The third speaker was Sr Robyn de Wet, an occupational health nurse, who spoke about the South African Nursing Council’s (SANC’s) soon-to-be-implemented continuous professional development (CPD) point system. Her main message was to encourage nurses to become familiar with how to document their points, so that they are compliant, and avoid being struck off the register of practitioners once CPD is implemented.

After breaking for lunch and allowing the delegates an opportunity to visit the exhibitors’ stands, the afternoon session was commenced with a presentation from clinical psychologist, Alistair Mork-Chadwick, on ‘Recognising burnout’. He highlighted the differences between burnout and depression, and discussed prevention and management. To drive his point home, he used the analogy of a glass of water to demonstrate that if we hold our patients too close, we risk burnout; but if we are too detached, we are not serving them as we should.

Occupational medicine practitioner, Dr John Do Vale, was the final speaker of the day, who presented a talk about the ‘Legalities of drug testing and consent’.

We closed the event with a lucky draw of prizes.

ACKNOWLEDGEMENTS

Exhibitors

A big thank you to the following exhibitors:

- The Ear Institute – a comprehensive range of hearing healthcare services for adults and children, ranging from a quick HearingCheck™ to a full diagnostic hearing evaluation
- SSEM Mthembu Medical – the leading distributor of electro-medical devices and medical consumables throughout southern Africa
- Ampath Laboratories – one of South Africa’s foremost laboratories, offering innovative professional and quality pathology and laboratory medicine services to healthcare practitioners and patients
- KwaZulu Private Ambulance – leaders in ambulance and emergency care, education and training, as well as event medical services
- Software 1066 – the home of ClinicSister and SHREQManager software solutions
- Electroserve – providing personal, yet professional, service in the ever-changing world of hi-tech medical equipment
- Royal Rehabilitation Hospital – a private sub-acute rehabilitation facility offering a wide variety of medical services that bridge the gap between acute, sub-acute and homecare
- Apex Environmental – SANAS 17020-accredited and Department of Employment and Labour-approved inspection authority (AIA), offering a range of specialist environmental and occupational hygiene monitoring services
- Kendon Laboratories – medical and remedial equipment and supplies, medical equipment and medical supplies
- Pearly Blue – a waste management company offering an environmental-centred business approach founded on safety, responsibility and service
- Omy Naidoo Dietician – an award-winning dietician based in Pietermaritzburg, who does regular podcasts
- Global Learning Services – providers of legislated skills training, who live by the ethos of individual performance enhancement in every sphere of training, maximising the potential of every employee and reducing the risk of injury and damage to property
- Midlands Medical Hospital – a private hospital comprising 274 beds across all major healthcare disciplines, situated in the central business district of Pietermaritzburg

Sponsors

The event was sponsored by Ampath Laboratories, Amberglades Retirement Village, Belgotex, Ear Institute, Illovo Sugar, Killarney Brick and Block, Occusure, Royal Hospital, Safari Nuts, and SSEM Mthembu Medical.

The KZN Inland Region Executive Committee members extend their sincere thanks to all members, exhibitors and sponsors for their generous support in making the day a success.
As part of the Southern African Institute for Occupational Hygiene’s (SAIOH’s) service to our members, we provide feedback below on the latest developments within the society. SAIOH exists due to, and 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 in this newsletter.

PRESIDENT’S ADDRESS

Hennie van der Westhuizen: SAIOH President
e-mail: president@saioh.co.za

OCCUPATIONAL HYGIENE AND ACADEMIA

In the spirit of growing its own timber, SAIOH recognises the sterling contributions by academic and training institutions that nurture the saplings that are in the process of becoming solid oaks in occupational hygiene – and in the community. Their input is instrumental in developing and honing the knowledge, skills, competence, and attitudes of future occupational hygienists. When comparing these attributes to the eight characteristics of professionalism described in Mind Tools, one cannot but acknowledge the invaluable contributions of these tertiary institutions. The characteristics or attributes listed in Mind Tools are competence, knowledge, conscientiousness, integrity, respect, emotional intelligence, appropriateness, and confidence. It is not surprising how the Council on Higher Education’s (CHE’s) philosophy of knowledge and skills, and the execution thereof by tertiary institutions, resonate in the attributes of a professional.

Several academic institutions offer formal tertiary courses in occupational hygiene. These courses are aimed at meeting the varying needs of tenders seeking a future in occupational hygiene. Prospective students may find more information about trainers and approved training providers on the SAIOH website. SAIOH has a designated forum – the Occupational Hygiene Skills Forum (OHSF) – to which training institutions may apply for recognition of their courses. This is not a complicated process; the basic criterion is that the curriculum comprises at least 50% occupational hygiene content.

Although details of the academic institutions are available on the website, SAIOH wishes to strengthen the alliance between itself and these institutions by offering them an opportunity to share relevant information about their curricula in this newsletter. This will be done in a structured manner. Each newsletter will allow the opportunity for one SAIOH-approved institution to showcase its courses. This opportunity will be extended to institutions as and when their curricula are approved.

SAIOH branch activities

Virtual meetings and workshops present numerous opportunities to SAIOH members. All SAIOH members are automatically invited to attend any SAIOH branch meeting (or event), regardless of their branch affiliations. We encourage all our members to support their branches, and to participate in branch activities and earn continuing professional development (CPD) points. Members can submit topics for discussion to the various branch Chairs, for consideration for future webinars/meetings and/or workshops.

The Western Cape branch hosted its second face-to-face meeting on 10 June 2022, where Rinus Kriel gave an interesting presentation on autotoxins; 42 persons attended. The Gauteng branch(es) held a virtual meeting (their second meeting) on 24 June 2022. Sean Chester gave an excellent presentation on toxicology (‘Human biology and target organs’); 53 persons attended. The KwaZulu-Natal (KZN) branch held their second meeting via Zoom, on 23 June 2022. Four KZN branch members presented on the new Hazardous Chemical Agent Regulations; 51 persons attended. The Botswana branch held a virtual meeting on 14 July 2022. There were two presentations, i.e. ‘Mine ventilation during COVID-19’, and ‘The effects on women working in open cast mines’.

With regard to online events by our stakeholders, the University of Pretoria (UP) held a public health webinar on Total Worker Health – an integrated, holistic approach to worker safety, health, and well-being (24 June 2022), and the International Commission
New SAIOH website
SAIOH engaged website developers to overhaul the current website – specifically to allow integration with our current member management system (MySAIOH). The administration teams are progressing well with the implementation and population of the new website.

SAIOH has started the process to implement an online credit card payment system on an accredited international platform, like PayU, to make electronic payments easier for members. As soon as this is finalised, SAIOH will notify all members with a guideline on how to use it. Special thanks go to Kate Smart for driving this initiative.

Communications
SAIOH publishes its newsletter and President’s address in two electronic media, namely Occupational Health Southern Africa (OHSA), and the African Occupational Safety and Health magazine (A-OS&H). These publications are issued every two months; the links are sent to all members via a Mailchimp and posted on our website. Three issues of these two publications have been sent to all SAIOH members this year.

SAIOH communicates daily with its stakeholders (e.g. the Department of Employment and Labour, Mine Health and Safety Council (MHSC), Mine Ventilation Society of South Africa (MVS SA), Ergonomics Society of South Africa (ESSA), South African Society of Occupational Medicine (SASOM), South African Society of Occupational Health Nursing Practitioners (SASOHN), Workplace Health Without Borders (WHWB), OH AIA Association, South African Institute of Occupational Safety and Health (Saiosh), South African National Accreditation System (SANAS), National Institute for Occupational Health (NIOH), National Institute for Occupational Safety and Health (NIOSSH), International Occupational Hygiene Association (IOHA) and the IOHA NARC, OHTA, Australian Institute of Occupational Hygienists (AIIOH), British Occupational Hygiene Society (BOHS), American Industrial Hygiene Association (AIHA), International Commission on Occupational Health (ICOH), University of Cape Town (UCT), etc.) i.e. via webinars, communicating important news, technical information, legislation changes, new standards, etc.

FROM THE PROFESSIONAL CERTIFICATION COMMITTEE (PCC)

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Certification assessments
A summary of results from the first quarter’s assessments for 2022 is provided in Table 1.

The second round of PCC written assessments took place on 24 June 2022, again mostly online. A total of 63 candidates wrote the assessment. Results are pending:

- OH assistants: 29
- OH technologists: 15
- Occupational hygienists: 19
### Table 1. Results for oral/final assessment (17 May 2022)

<table>
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<th>Certification category</th>
<th>Assessed</th>
<th>Passed</th>
<th>Failed</th>
<th>Pass rate</th>
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<td>53</td>
<td>6</td>
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<td>25</td>
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</tbody>
</table>

A special PCC technical team is hard at work revising the PCC oral assessment format and questions, in line with the occupational hygiene self-assessment tool, ensuring not only that the growing field of occupational hygiene is covered, but also that the assessment format and tools continue to improve over time and are not subjective.

### Occupational Hygiene Skills Forum (OHSF)

The SAIOH OHSF was initiated to co-ordinate all aspects related to the recognition of occupational hygiene training materials (e.g. the AIHA Basic Industrial Hygiene Course at the registered occupational hygiene assistant (ROHA) level, OH training providers and institutions, and the development and management of assessment and examination systems, where required. Another function of the OHSF is to evaluate applications from tertiary institutions for recognition of their occupational hygiene-related qualifications. The OHSF is progressing well with this.

North-West University’s and the Tshwane University of Technology’s four-year bachelor’s degrees were recognised by the OHSF as meeting the criteria at the registered occupational hygienist (ROH) level. The OHSF is currently evaluating the University of the Witwatersrand’s and the Cape Peninsula University of Technology’s programmes.

All tertiary institutions that offer OH qualifications are encouraged to contact the PCC administrator for information regarding application for recognition (lee@saioh.co.za).

Details of recognised training providers and recognised qualifications will be posted on the SAIOH website (www.saioh.co.za). This will make it easier for potential students and certification candidates to select suitable occupational hygiene training programmes that meet SAIOH and international requirements.

### REFERENCES

Guideline for the compilation of a mandatory code of practice for an occupational health programme (occupational hygiene and medical surveillance) for noise: an update

Dipalesa Mokoboto: Medical Inspector, Department of Mineral Resources and Energy; MMPA President
e-mail: Dipalesa.Mokoboto@dmre.gov.za

INTRODUCTION
The Guideline for the compilation of a mandatory code of practice (MCOP) for an occupational health programme (occupational hygiene and medical surveillance) for noise was first promulgated on 1 February 2002. The Mining Occupational Health Advisory Committee (MOHAC) embarked on a process of reviewing the Guideline in June 2021. The reviewed Guideline was promulgated by the Department of Mineral Resources and Energy (DMRE) in Government Gazette No. 45903, 11 February. The review was long overdue, and it was necessary to update the Guideline with the latest developments as per SANS 10083 (the measurement and assessment of occupational noise for hearing conservation purposes) and the Guidance Note on standard threshold shift (STS). It is thus important that the Guideline is read in conjunction with the Guideline for the compilation of a mandatory code of practice on minimum standards of fitness to perform work at a mine (reference number DMR 16/3/2/3-A3) and the Guidance Note for the implementation of STS in medical surveillance of NIHL (reference number DMR 16/3/2/3-B8).

This DMRE Guideline will assist employers with the establishment of an occupational hearing conservation programme, but does not stipulate requirements for specific circumstances. It considers that there are different mines in South Africa and their risks are not the same, thus their programmes will have to be tailored according to their risk assessment results.

OBJECTIVES OF THE GUIDELINE
The objective of the Guideline is to enable the employer at every mine to compile a MCOP which, if properly implemented and complied with, would assist in monitoring and reducing employees’ exposure to noise. The Guideline provides general guidance on the required format and content for the MCOP and provides sufficient technical background to enable the drafting committee at the mine to prepare a comprehensive and practical MCOP for their mine. The Guideline considers two components of an occupational health programme:

1. Occupational hygiene, where the employer is required, in terms of regulation 9.2(2) or section 12 of the Mine Health and Safety Act (MHA), to establish and maintain a system of occupational hygiene measurements in respect of occupational exposure to noise.

2. Medical surveillance, where the employer is required, in terms of section 13 or regulation 11.4 of the MHA, to establish and maintain a system of medical surveillance.

SCOPE OF THE GUIDELINE
The Guideline covers a basic occupational health programme to assist in protecting employees from occupational noise-induced hearing loss (NIHL). It further provides for the measurement of occupational exposures to noise and the linking of these exposures to employee medical records. Regulations 9.2(1) and 9.2(2) of the MHA prescribe that the employer must ensure that occupational exposure to noise is maintained below the occupational exposure level (OEL) of 85 dB. This Guideline will assist the employer to comply with the legal requirements. For purposes of this article, focus is on medical surveillance pertaining to NIHL.

Medical surveillance
Section 13(2)(c) of the MHA requires a system of medical surveillance to consist of an initial medical examination, periodic medical examinations at appropriate intervals, and an exit medical examination in line with section 17. Regulation 11.4(2), read with sections 11(3) and 11(4) of the MHA, provides that the system of medical surveillance relating to noise must consist of:

- A baseline audiogram
- Periodic audiograms
- An exit audiogram
- Any additional audiogram required in terms of the employer’s risk assessment

Audiometry
Employees need to undergo audiometric testing where a hearing conservation programme is required. The programme is required when noise engineering controls have not been possible or have failed to eliminate the noise hazard. Audiometric testing should be regarded as a means of identifying and prioritising problem areas to enable implementation of appropriate interventions. Testing cannot be viewed as a solution to decrease the risk of NIHL in the absence of appropriate control measures. Mandatory audiometric testing must be conducted by the employer at no cost to the employee, using a registered audiometrist or an occupational health practitioner with a certificate in audiometry.

Initial and baseline audiometry
A baseline audiogram is an initial audiogram conducted to establish a reference against which subsequent audiograms can be compared. Employees need to have a valid baseline audiogram before
commencing employment within a noise zone and enrolling in a hearing conservation programme. This audiometry should be done within 30 days of commencement of employment. A valid baseline result determined at a previous working place remains relevant at the next working place if it meets the audiometric test requirement mentioned in the Guideline. Baseline audiograms should be used to determine future compensable hearing loss and the hearing status of an employee.

Screening audiometry should be conducted to establish a baseline audiogram and, if the results are abnormal, the employee should be referred to the audiologist to establish a baseline. A valid baseline involves two comparable screening tests conducted in one day. If this is not possible, then the test should be repeated within 30 days of employment, or before transfer to a noise zone. Two baselines are mentioned in the Guideline:

1. **Instruction 171 baseline** – an audiometry test is conducted on an employee entering the mining industry for the first time and will be the baseline of that employee for the rest of his/her working career unless there is a need to revise it. The Instruction 171 baseline was intended to be complete for existing mine employees by December 2003.

2. **STS baseline** – this baseline was introduced to the mining industry after Instruction 171, and was expected to have been completed by December 2017, according to the DMRE Guidance Note for the implementation of STS in medical surveillance of NIHL. This baseline is repeated every time an employee changes employment because it is used for assisting the employer in preventing NIHL.

For someone entering the mining industry for the first time after December 2017, the Instruction 171 baseline audiogram may be used as the STS baseline audiogram, at the first employer only.

**Revised baseline audiometry**

The above-mentioned baselines may need to be revised as follows:

a) The Instruction 171 baseline is revised when an employee has been compensated for NIHL, in which case the audiogram test results used for compensation become the new baseline.

b) The STS baseline is revised when there is an average change in hearing of 25 dB or more, at the frequencies of 2 000, 3 000 and 4 000 Hz in one or both ears, when compared to the employee's STS baseline audiogram.

Both revised baselines must be diagnostic audiograms, thus the tests should be conducted by an audiologist.

**Periodic audiometry**

The employer must conduct periodic audiometric evaluations on an annual basis for all employees having noise exposure levels that equal or exceed 85 dBA. Where employees are exposed to an 8-hour rating level equal to or higher than 105 dBA, audiogram tests should be conducted at intervals not exceeding six months. Periodic audiometry shall be conducted to determine:

- The occurrence and extent of any STS, i.e. to determine the need for further investigation, and to monitor the efficiency of the hearing conservation programme
- Whether a percentage loss of hearing (PLH) shift of 5% has occurred for what is considered early NIHL
- Whether a PLH shift of 10% has occurred for compensable hearing loss

In any of the above scenarios, the employee will need to be referred to an audiologist for a confirmatory diagnostic audiogram, and for investigations to assist with further interventions, whereby:

a) An analysis of the contribution of noise exposure to the hearing loss of the employee is conducted

b) After a diagnostic audiogram is performed to ascertain if the above scenarios are work related, a section 11(5) investigation of the MHSA needs to be initiated and may include, amongst others, the following interventions:
- Retraining of employees regarding the hearing conservation programme and how to use hearing protective devices
- Careful inspection of hearing protection devices used by the employee for possible shortcomings
- Identifying necessary steps to prevent further STS or PLH shift

**Exit audiogram**

An exit audiogram is conducted when an employee leaves the mine through retrenchment, retirement, or medical incapacity. The employer must conduct an audiometric evaluation for all persons at the conclusion of employment in a noise zone.

The exit audiogram test results are compared to the baseline audiogram test results. If the difference in PLH from baseline to exit is 10% or more, the individual shall be referred for diagnostic audiometry. Any employee diagnosed with a PLH shift of 5% to 10% or an STS of 25 dB for the first time on exit is required to have the relevant investigation.

**CONCLUSION**

All audiometric evaluations are required to be preceded by a period of at least 16 hours during which there is no exposure to noise levels ≥ 85 dBA. The use of hearing protection devices with attenuation of noise during this 16-hour period will not qualify as non-exposure to noise.

Before audiometric testing, an otoscopic examination is needed to examine the external ear canals of an employee to exclude presence of wax or infections such as otitis media with perforation of the ear drum. Any of these conditions could result in hearing loss. Where required, successful treatment is possible and needs to be completed before testing is done.

It is necessary to obtain the medical history of the employee undergoing audiometry testing, focusing on previous traumatic incidents, use of ototoxic medication, or other non-auditory events that could have influenced the employee's hearing. The occupational history of the employee is also very important; a record of hazardous work is necessary in terms of exposure levels in the different working environments.

It is clear that a holistic approach is necessary for all employees undergoing audiometric evaluations during medical surveillance to establish if the hearing loss is work related or not, and to ensure that adequate interventions are made. The employer should report all cases of confirmed compensable NIHL to the relevant authority, as per relevant compensation legislation. Audiogram results for all employees must be stored with other medical surveillance records in line with section 15 of the MHSA, for a period of 40 years.
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Mine waste leaves toxic legacies

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On 31 May 2022, the Mine Tailings Working Group of South Africa, a partnership of civil society groups, including the Bench Marks Foundation, Federation for Sustainable Environment (FSE) and the International Alliance on Natural Resources in Africa (IANRA), hosted a hybrid seminar at the University of Johannesburg, South Africa.

The first part of the seminar focused on South African tailings facilities – highlighting the legal situation and the impacts on mining-affected communities. The environmental, social and health effects of mine waste facilities, called tailings dams, are extreme, and some speakers from affected communities presented their impacts.

Waste from gold mines constitutes the largest single source of waste and pollution in South Africa and there is wide acceptance that water pollution from mining operations is responsible for the most-costly environmental and socio-economic impacts. On the Witwatersrand gold fields, more than 120 mines have extracted 43 500 tons of gold in one century and 73 000 tons of uranium from 1953 to 1995, leaving a legacy of more than 270 tailings facilities that cover approximately 400 km². Contamination, including air, water and soil pollution, have significant health impacts on surrounding communities, many of which are composed of low-income homes.

The working group finds that current laws and regulations in South Africa are not preventing or mitigating the detrimental impacts of tailings dams. These shortcomings include a lack of adequate regulations for mine closure and dust emissions, insufficient buffer zones between tailings facilities and communities, a lack of control and maintenance for abandoned tailings dams, and misclassification of the reprocessing of residual gold and other metals from historic tailings facilities and residue stockpiles.

Mariette Liefferink from FSE notes that “it is widely recognised that problems related to mining waste (tailings) may be rated as second only to global warming and stratospheric ozone depletion in terms of ecological risk. The release to the environment of mining waste can result in profound, generally irreversible destruction of ecosystems. Waste from gold mines constitutes the largest single source of waste and pollution in South Africa.

Gold mining waste was estimated to account for 221 million tonnes, or 47% of all mineral waste produced in South Africa, making it the largest, single source of waste and pollution.”

“The South African government must introduce regulatory reforms that will ensure effective transparency and monitoring of tailings facilities”, says Hassen Lorgat from the Bench Marks Foundation and a convenor of the working group.

“We have noticed a number of corporations starting to talk about tailings management but talk is cheap. Real reform begins with the Government making real legislative reforms. But corporations do not have to wait for that and must include mining communities and independent experts as part of the oversight for individual tailings management”, he added.

South Africa is not alone in dealing with unsafe and abandoned tailings facilities; communities from Madagascar, Brazil, and the United States face similar issues. Tailings dams are failing with increasing frequency and severity. Recent tailings dam failures across the world have led to over 300 deaths, hundreds of kilometers of contaminated rivers and ecosystems, and have resulted in billions in lost profits and remediation costs for mining companies.

As climate change brings increasingly severe and extreme weather conditions, tailings dams are becoming more and more of a risk.

The 31 May seminar coincided with the publication of Safety First: Guidelines for Responsible Mine Tailing Management (available at www.earthworks.org/safety-first), an updated set of guidelines for improving the management of mine waste disposal facilities, endorsed by an international group of scientists, communities, Indigenous Peoples and civil society groups.

“Dangerous tailings dams threaten thousands of communities across the globe. There must be civil society oversight for tailings dams, as well as rigorous, independent third-party technical review”, said Jamie Kneen of MiningWatch Canada. “It is clear that much more stringent oversight of the mining industry is urgently needed.”
Rand Mutual Assurance launches its Prevention Programme

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For 128 years, Rand Mutual Assurance (RMA) has been administering claims for occupational injuries and diseases according to the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 (COIDA). RMA is passionate about caring for the lives of its claimants and their families and has the licence to administer claims for both the mining- and metals-related industries.

In April 2022, RMA launched its Prevention Programme as part of one of the company’s key strategic focus areas. RMA believes that the prevention of injuries and diseases at work is crucial to contribute to enhanced employee productivity for employers and, more importantly, to improve the health and safety of employees. As a mutual assurance company, RMA understands the impact of working conditions and environments that contribute to workplace fatalities, injuries and diseases. RMA believes that such events can be prevented by being proactive and helping our members put actions in place before an event occurs.

The Prevention Programme will be driven by the Occupational Health and Safety Act No. 85 of 1993. In addition, the COIDA has specific provisions that require RMA to implement an effective prevention programme that reduces occupational injuries and diseases in the workplace.

RMA’s Prevention Programme supports employers’ existing initiatives for the benefit of their employees and aims to complement their existing occupational health and safety (OHS) systems. A successful and effective prevention programme requires the involvement of all the key stakeholders in the occupational health and safety value chain. RMA’s Prevention Programme is premised on partnering with employers, employees and unions to reduce occupational incidents by offering a blend of OHS and financial wellness solutions that improve employee safety, reduce the severity of injuries, and reduce the debt burden of employees. Working closely with our stakeholders will enable the delivery of strategic actions where, together, the greatest impact on illnesses and injury reduction can transpire. Every stakeholder has a responsibility to reduce the incidence of OHS incidents. Working together allows for greater collaboration and partnering to increase the reach for the goal of improving employee health and safety.

Understanding the hazards and inherent risks in our client’s businesses, our Prevention Programme will ensure that we partner with our clients in their efforts to achieve effective management of OHS, where our assessment, solutions and evaluations will result in sustainable safety benefits for our employers. RMA will adopt a data-driven approach to raise awareness of occupational injuries and diseases in the workplace, and identify those who are the most affected or at the highest risk.

RMA’s Prevention Programme is aimed at the metals industry, initially. Claim data suggest that this industry would benefit greatly from such a programme, given the types of injuries that RMA administers and the incidence of injuries in comparison to the mining industry. The programme aims to reduce occupational injuries and diseases in the workplace, creating a safe place of work for employees and having tangible benefits for the employer. Safety is not only an ethical and moral business imperative, but also results in financial benefits for organisations. Failure to consider OHS can result in increased damage to property and equipment, absenteeism and presenteeism, legal costs, reputational damage, and loss in productivity. RMA’s Prevention Programme makes business sense. Having this programme in place ensures a beneficial partnership for RMA and its clients, which is not only about compensation but also about assisting its clients in preventing work-related accidents and injuries, and promoting the safety of their employees. There is always room for improvement and, with a focus on current evidence and our approach to prevention, this initiative will have an effect on claim and injury rates. This will lead to an improved health and safety culture that has benefits extending beyond the workplace.

If you have any questions about the RMA Prevention Programme and how we can work closely with you, please contact our team at rmaprevention@randmutual.co.za.
Positive industry turnout for A-OSH Expo, 2022

Amanda Dube: Marketing Coordinator, Specialised Exhibitions

While there was a very small drop in visitor numbers compared with the 2019 figures, reflecting the same trend already seen this year both locally and globally, the quality of visitors across the board is still extremely high.

The four trade shows also brought in a number of visitors from outside South Africa’s borders, with an excellent turnout from neighbouring African countries in particular.

Excellent feedback from exhibitors was received across all four shows. “It’s clear that this type of live event is now more important than ever in terms of building face-to-face connections and relationships, as well as allowing for a first-hand experience of new offerings”, said Anderson. “The BBF Safety Group is very committed to A-OSH Expo, and we are very pleased that we have had a busy stand”, disclosed BBF Safety Group’s Ruan Breedt. “We had a brilliant turnout and I’m very happy with the attendance. There has been significant appreciation from the visitors, who have been very interested.”


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HASS Industrial supplies custom-made hearing protection devices and hearing conservation management programmes

Photograph: Wendy Lopes

Haslac offers occupational health and safety legislation training

Photograph: Wendy Lopes
Award-winning occupational health audiometry enabling business to have faster, more efficient and affordable hearing testing procedures, on site

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In a study conducted in South Africa and published in 2011, 73.2% of miners from 14 mines were exposed to excessive noise, above the legislated occupational exposure limit of 85 dB, despite hearing conservation programmes implemented in the mining sector. Hearing conservation programmes in South Africa are characterised as very complex, expensive, time intensive, and dependent on equipment and soundproof booths.

Audiometric testing in occupational health settings helps to determine if occupational hearing loss is being prevented by the noise control measures in place. As occupational hearing loss occurs gradually, workers often fail to notice changes in their hearing ability until significant deterioration occurs. This can be avoided by conducting annual hearing checks, and taking appropriate action as soon as a change is detected – when comparing audiometry results with those from previous years. Annual hearing checks also contribute to increased productivity in the workforce, reduced workplace injuries and communication barriers, and ensure adherence to regulations.

Developed in close co-operation with audiologists and safety professionals, hearX Group's hearTest Occ Health solution is an IEC-certified tablet-based audiometer for seamless occupational hearing testing, fully compliant to OSHA and SANS requirements. With automated audiogram threshold tracking and assessments at the click of a button, hearTest Occ Health allows for simplified patient counselling, efficient on-site screening, and seamless reporting, without the need for third-party vendors. This digital solution provides attenuation equivalent to a single-wall sound booth, allowing the freedom of portable, reliable and cost-effective occupational health audiometry for businesses. hearTest Occ Health enables workplace hearing screening anywhere, any time, without the need for bulky equipment, and offers a variety of features including:

- Percentage loss of hearing (PLH) and standard threshold shift (STS) calculations, with the option to enable age adjustments when determining if a valid shift occurred
- Pre-test questions that ensure detailed data capturing by recording patient information to ensure compliance to standards and conformance to operational test requirements
- Optimisation of testing times by preloading patient, facility and testing information to the device
- Monitor of changes in hearing health by manually adding a baseline or importing the screening test as a baseline test
- Smart features that ensure on-site quality control and test reliability. Quality control metrics include noise monitoring, false response counts, response times, and 1 kHz retest
- Use of automated testing and smart algorithms – significantly faster than traditional screening services, allowing for accurate, easy and reliable automated tests
- The hearScope digital video otoscope, which can integrate with the hearTest Occ Health device to include eardrum images on patient records
- mHealth Studio, which is included free with any hearTest Occ Health subscription. mHealth Studio allows for online data management, surveillance, referrals and report generation, safe and reliable storage of clinical data, and a graphical comparison of baseline and screening tests, providing you with full access and control over all employee test data

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