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Division of the National Health Laboratory Service

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Africa's informal economy is one of the most innovative and inventive. Yet it is an environment with little regulation in which workers are often exposed to hard conditions and live without a safety net.

- Richard Attias

inside

THIS ISSUE

Editorial team:
Mr Vuyo Sabani | Prof Nisha Naicker | Dr Kerry Wilson | Ms Zandile Hoyi | Mr Ashraf Ryklief | Mr Msingathi Magwaxaza

MESSAGE FROM THE EDITOR

Did you know that two billion workers earn their living in the informal economy worldwide? In Africa, 85,5% of employees work in the informal economy. That is according to the International Labour Organization (ILO). The informal economy is extensive and covers various jobs such as home-based workers, taxi driving, waste picking, and street vending. Despite it's economic contribution, the work conditions in the informal economy make informal workers extremely vulnerable to HIV, TB, and other diseases. In this issue, which covers the last quarter (January to March) of the 2022/2023 financial year, we put the spotlight on informal economy workers' health and safety.

The NIOH has had various initiatives aimed at informal economy workers. The organisation provided HIV and TB awareness campaigns for street vendors and taxi drivers at Johannesburg and Katlehong taxi ranks. We have conducted training on HIV, TB, Silicosis, and Asbestos in the workplace for the construction industry. Recently, we developed and launched educational materials for the informal economy workers in partnership with ILO. See the service delivery section for more details on the work the NIOH has put in place to create more awareness about health matters in the informal economy.

In the surveillance section, we share the findings of the Occupational Allergy Surveillance 2022 report by the Occupational Allergy Unit. Even though the report has noted a decline in the number of referrals since the outbreak of the COVID-19 pandemic, it calls for more research and implementation of control measures in various industries to protect workers. In the publications section, we share summaries of the published work the NIOH staff was part of in the previous quarter. Ms Danai Kwenda, South African Field Epidemiology Training Programme (SAFETP) Resident in the NIOH Epidemiology and Surveillance section, shares how she got into her career and her goals for the future in the spotlight section.

In the teaching and training section, we give an update on the upcoming training from the NIOH and reflect on the training that took place between January and March this year. The NIOH and National Economic Development and Labour Council (NEDLAC), supported by the Department of Employment and Labour's (DoEL) Compensation Fund, have partnered to deliver COVID-19-related Occupational Health and Safety Education and Awareness programme for workplaces. The programme creates COVID-19-related occupational health and safety resources that workplaces can use to advocate, educate and inform their workers. This project is delivered in various formats – short videos, fact sheets/posters, and webinars. Visit our website, YouTube Channel and Twitter page for the latest information on upcoming webinars.

Lastly, we welcome the new NIOH Research Committee Chair, Prof Nisha Naicker, who has joined the OccuZone editorial team. Prof Naicker, who currently heads the NIOH Epidemiology and Surveillance section, will engage us through the Research Committee Chair column and the Research Focus. We wish her well in her new role and look forward to a long and fruitful working partnership.

Until our next issue, enjoy the read!

Vuyo Sabani

MESSAGE FROM THE RESEARCH COMMITTEE CHAIR

The informal economy is defined by the International Labour Organization (ILO) as “all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements. It thrives mostly in a context of high unemployment, underemployment, poverty, gender inequality and precarious work”. South Africa has a growing informal economy due to the high levels of unemployment and poverty. It contributes substantially to the gross domestic product (GDP) of the country by providing employment to workers that may not have access to formal employment due to limited education and skills. These workers face a number of challenges such as the possibility of unsafe working environments, poor access to health care and social protection.

Over the last few years the NIOH in collaboration with international agencies (ILO, WHO, WIEGO) have added to the body of research on informal workers within the South African context. Studies on waste pickers (street and landfill sites), street vendors, and golf course caddies as well as comparison of health outcomes between formal and informal workers have been conducted. The publications and reports can be sourced from the NIOH website (https://www.nioh.ac.za/). The knowledge generated from these studies has been used to create occupational health and safety awareness campaigns, workshops as well as educational materials to empower the workers and employers.

The focus on the informal and precarious employment sectors will remain, with the aim of contributing to the achievement of decent work for all as well as the Sustainable Development Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

Prof Nisha Naicker

RESEARCH FOCUS

The research agenda of the National Institute for Occupational Health includes a focus on research translation. Research translation is the process of taking knowledge generated through studies and making it accessible and applicable to all stakeholders in the field of occupational health. The ultimate aim is to bridge the gap between scientific research and to create tangible outcomes and practical solutions to improve the health and safety of workers.

A multidisciplinary approach is required bringing together the researchers, practitioners, workers, management and decision-makers within the industry. Thus effective research translation includes stakeholder engagement, exchange of knowledge between all stakeholders and implementation science to establish the most suitable way to implement evidence-based findings, interventions and policies into practical solutions.

In this issue of OccuZone, the specialized service delivery component highlighted the HIV and TB campaigns aimed at vulnerable workers such as street vendors and taxi drivers, development of health educational material for dissemination to informal economy workers as well as the provision of workshops on silica dust and asbestos exposure to workers in the construction history.

The Occupational Allergy Unit surveillance report showed that the most common positive aeroallergen in 2022 was House Dust Mites and the top contact allergens identified were nickel, formaldehyde, colophonium (resin), methylisothiazolinone / Methylchloroisothiazolinone (preservatives in shampoos and other personal care products), and potassium dichromate (tanning, painting, printing and electroplating). The results highlighted the need for more research, and implementation of control measures in these industries. The Microbiology and Immunology section in the NIOH regularly conducted workshops on allergies in the workplace to empower workers and create a safer environment for workers.

PUBLICATIONS

Title: Exposure Characterization of Wood Dust Particulate, Endotoxins, and (1-3)-β-D-Glucans, and Their Determinants in Mozambiquan Wood Processing Workers

Author(s): Chamba, P.S., Baatjies, R., **Singh, T.S.**, Cumbane, A.J., Jeebhay, M.F.

Source: Annals of Work Exposures and Health, 2023, XX, 1–11 https://doi.org/10.1093/annweh/
Advance access publication 28 January 2023

Abstract: Objectives: Dust generated from wood processing comprises a heterogeneous mixture of inorganic and organic particles, including wood fragments, microorganisms, endotoxins, (1–3)-β-d-glucans, and allergens. This study characterized exposure to wood dust and its determinants in the Mozambiquan wood processing industry.

Methods: A total of 124 personal inhalable samples, collected from a stratified random sample of 30 workers, were analysed for dust particulate, endotoxins, and (1–3)-β-d-glucans. Mixed-effects models were developed to investigate significant exposure determinants.

Results: The geometric mean (GM) inhalable dust particulate concentrations were 3.29 mg m−3, 98 endotoxin units (EU) m−3, and 123 ng m−3 for (1–3)-β-d-glucans. Significant predictors for higher particulate levels included machinery (GMR = 1.93), sawing (GMR = 2.80), carpentry (GMR = 2.77), or painting (GMR = 3.03) tasks. Lebombo-ironwood species was associated with higher dust particulate levels (GMR = 1.97). Determinants of endotoxin concentrations included working with dry wood and damp cleaning methods, which were associated with lower levels. Working in closed buildings (GMR = 3.10) and dry sweeping methods were associated with higher (1–3)-β-d-glucan concentrations (GMR = 1.99).

Conclusions: Work tasks in certain exposure groups (machinery, sawing, carpentry, painting), processing certain wood species (Lebombo-ironwood) and working in closed buildings were associated with higher exposures, whilst using dry wood and damp cleaning practices reduced exposure levels.

Keywords: determinants of exposure; endotoxins; glucans; occupational exposure; wood dust

Title: Strengthening Occupational Health Systems in the Post-Covid-19 and the State of Disaster era in South Africa: Strategies for the Road Ahead

Author(s): Sonday, Z., Nagoorsamy, C., Weinand, F., Adams, S., Hariparsad, S., **Kgalamono, S.**, et al.

Source: Occup Health Southern Afr. 2023; 29(1): 49-50

Abstract: South Africa has emerged from the COVID-19 pandemic with major impacts on communities – from loss of family members and severe disabilities, to considerable economic consequences. During the Pandemic, South Africa called on its workers to be on the front-line to protect the health of people and communities to ensure that our factories, mines, educational institutions, markets, and commercial centres continued to drive the economy. This placed workers in many economic sectors at risk of being infected and a considerable number experienced the more severe forms of the disease. Stakeholders in various occupational contexts responded in a variety of ways.

Title: Factors associated with TB screening among agricultural workers in Limpopo Province, South Africa

Author(s): Mlamgeni, N., Malotle, M., Made, F., Ramodike, J., Sikweyiya, Y., Du Preez, C., Thompson N.S., Zungu, M.

Source: GLOBAL HEALTH ACTION 2023, VOL. 16, 2162227 https://doi.org/10.1080/16549716.2022.2162227

Background: Tuberculosis (TB) continues to be a public health issue of concern in South Africa. Workers in the agricultural sector are generally at increased risk of TB due to multiple interacting factors such as exposure to silica dust, co-worker infection, and occupations falling within the lower socio-economic sectors.

Objective: This study investigates factors associated with TB screening uptake for agricultural workers in Limpopo Province, South Africa.

Method: This cross-sectional study targeted a study population of 16,787 agricultural workers across 96 agricultural worksites in South Africa. A two-stage cluster random sampling design identified 24 agricultural worksites and a potential 2500 participants. The outcome variable was self-reported TB screening. Descriptive statistics and unadjusted and adjusted logistic regression analyses were performed to determine factors associated with TB screening. A literature review informed the selection of covariates as possible confounders.

Results: The final study sample comprised 2144 workers across 24 sites, with 55% being women. TB screening uptake was 1155 (56.3%). Factors such as living with human immunodeficiency virus (HIV) (AOR 3.16, 95% CI: 2.44–4.09), accessing health services in the workplace (AOR 1.94, 95% CI: 1.09–3.46), and having prior TB knowledge (AOR 18.45, 95% CI: 9.8–34.74) were positively associated with TB screening. Participants in the age group 36–49 years had significantly higher odds of self-reporting TB screening, compared with those aged 18–25 years (AOR 1.37, 95% CI 1.07–1.77). Migrant workers from Mozambique (OR 0.52, 95% CI: 0.34–0.79) and Zimbabwe (OR 0.71, 95% CI 0.57–0.89) were significantly less likely to self-report TB screening compared to their South African counterparts.

Conclusion: The findings underscore the importance of workplace health services in achieving end-TB targets. We recommend programs and interventions for preventing TB in South Africa that target the agricultural sector in general, and in particular migrant workers.

Keywords: Agricultural workers; occupational health; TB prevention; migrant health; access to healthcare; workers' health

Title: Potential Exposure to Respiratory and Enteric Bacterial Pathogens among Wastewater Treatment Plant Workers, South Africa

Author(s): Poopedi, E., Singh, T., Gomba, A.

Source: Int. J. Environ. Res. Public Health 2023, 20, 4338. https://doi.org/10.3390/ijerph20054338

Abstract: Wastewater handling has been associated with an increased risk of developing adverse health effects, including respiratory and gastrointestinal illnesses. However, there is a paucity of information in the literature, and occupational health risks are not well quantified. Grab influent samples were analysed using Illumina Miseq 16S amplicon sequencing to assess potential worker exposure to bacterial pathogens occurring in five municipal wastewater treatment plants (WWTPs). The most predominant phyla were Bacteroidota, Campilobacterota, Proteobacteria, Firmicutes, and Desulfobacterota, accounting for 85.4% of the total bacterial community. Taxonomic analysis showed a relatively low diversity of bacterial composition of the predominant genera across all WWTPs, indicating a high degree of bacterial community stability in the influent source. Pathogenic bacterial genera of human health concern included Mycobacterium, Coxiella, Escherichia/Shigella, Arcobacter, Acinetobacter, Streptococcus, Treponema, and Aeromonas. Furthermore, WHO-listed inherently resistant opportunistic bacterial genera were identified. These results suggest that WWTP workers may be occupationally exposed to several bacterial genera classified as hazardous biological agents for humans. Therefore, there is a need for comprehensive risk assessments to ascertain the actual risks and health outcomes among WWTP workers and inform effective intervention strategies to reduce worker exposure.

Keywords: domestic wastewater; sanitation workers; biological hazards; occupational exposure; waterborne diseases

Title: Strengthening Social Compact and Innovative Health Sector Collaborations in Addressing COVID-19 in South African Workplaces

Author(s): Jeebhay, M.F., Naidoo, R.N., Naidoo, S., Adams, S., **Zungu, M**., Kgalamono, S., Naicker, N., and Kistnasamy, B.

Source: NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy 1–16 DOI: 10.1177/10482911221150237

Abstract: Workplaces are nodes for Severe Acute Respiratory Syndrome Coronavirus 2 transmission and require strategies to protect workers' health. This article reports on the South African national coronavirus disease 2019 (COVID-19) strategy that sought to ensure workers' health, protect the economic activity, safeguard livelihoods and support health services. Data from the Occupational Health Surveillance System, Surveillance System of Sentinel Hospital Sites, and government databases (public sector health worker and Compensation Fund data) was supplemented by peer-reviewed articles and grey literature. A multipronged, multi-stakeholder response to occupational health and safety (OHS) policy development, risk management, health surveillance, information, and training was adopted, underpinned by scientific input, through collaboration between government, organized labour, employer bodies, academia, and community partners. This resulted in government-promulgated legislation addressing OHS, sectoral guidelines, and work-related COVID-19 worker's compensation. The OHS Workstream of the National Department of Health provided leadership and technical support for COVID-specific workplace guidelines and practices, surveillance, information, and training, as well as a workplace-based vaccination strategy.

Keywords: COVID-19, workplaces, multistakeholder collaboration, framework response, risk mitigation

Title: A gene Regulation Model Reveals an Ancestral Adaptation Response to Particulate Exposure Triggered by Nanomaterials

Author(s): del Giudice, G., Serra, A., Saarimäki, L.A., Kotsis, K., Rouse, I., Colibaba, S.A., Jagiello, K., Mikolajczyk, A., Papadiamantis, A.G., **Sanabria, N**., et al.

Source: https://doi.org/10.21203/rs.3.rs-1547187/v1

Abstract: Toxicogenomics aims at characterising the mechanism of action (MOA) of environmental exposures, and often relies on transcriptomics to investigate the responses of exposed biological systems. However, the identification of shared toxicogenomics-derived signatures across exposed biological systems is hampered by the complexity and heterogeneity of transcriptomics data. Given the lack of a clear transcriptomic signature of exposure, we hypothesise that common patterns of gene regulation could explain the response to engineered nanomaterials (ENM) across biological systems, disentangling the complexity of their MOA. We performed meta-analysis of a large collection of transcriptomics data from various ENM exposure studies and identified deregulation of immune functions as a prominent response across different ENM exposures. This pattern of transcriptional deregulation differed significantly from exposure to drugs. By investigating the promoter regions of genes frequently altered both in vitro and in vivo following exposure to ENM, we identified a set of binding sites for zinc finger transcription factors C2H2 involved in chromatin remodelling and immunomodulation. We further demonstrate that this gene regulatory model also underlies the transcriptomic MOA in non-mammal species of ecotoxicological interest exposed to ENMs, suggesting that it may be part of the innate immune system conserved by natural selection.

Title: Renewed Focus on Re-emerging Occupational Biohazards

Author(s): Ross, M.H., **Singh, T.**

Source: Occup Health Southern Afr. 2023; 29(1): 28-30

Abstract: The COVID-19 pandemic has highlighted the importance of preventing biohazards including non-infectious biological agents in the workplace, collaboration between public and occupational health and investment in research for prevention, outbreak control and sharing infectious disease data globally. Biological agents in the workplace can cause occupational disease, and some workplaces and conditions provide an ideal environment for generating and transmitting biological agents. Global climate changes, overuse of antimicrobials in medicine, intensified farm settings, and closer interactions with animals have been identified as factors facilitating the emergence or re-emergence of zoonotic bacterial infections.

However, biological hazards have been recognised for only a selection of worker groups with obvious exposure, and the definition of diseases caused by biological hazards has been limited. Pre-COVID-19, about 10% and 18% of workers in the United States were employed in occupations where exposure to disease or infection occurs at least once per week or at least once per month. The identification of occupational hazards related to biological agents in the workplace is difficult and requires global guidance and collaboration between authorities and institutions responsible for occupational health and safety, public health, environmental health, animal health protection and food safety. Technical progress has been made to eliminate or eradicate biological threats, but there is still a lack of knowledge and awareness of exposures to biological agents and related health problems. Furthermore, there are no comprehensive global policies and guidelines to prevent and control biohazards in the workplace.

Keywords: Biohazards, infectious and non-infectious agents, zoonotic diseases, prevention and control

Title: Work-related Adult-onset Atopic Dermatitis: Two Illustrative Case Reports

Author(s): Carman, H., **Fourie, A.**

Source: Occup Health Southern Afr. 2023; 29(1)

Abstract: A topic dermatitis, a chronic recurrent inflammatory skin disease, typically occurs in childhood, but also affects 1–3% of adults. Adult-onset atopic dermatitis has been described and accepted as an entity, and does not necessarily conform to the criteria tabled in the various guidelines published in the literature. Workers with occupational dermatitis in Gauteng are referred to the National Institute for Occupational Health. Of those diagnosed with contact dermatitis, many are also deemed to have atopic dermatitis. We present two cases that were initially diagnosed as occupational contact dermatitis but were then shown to have adult-onset atopic dermatitis. In these patients, the condition was chronic, recurrent, and persisted after removal from the workplace. They did not have preexisting atopic eczema and the eczema seemed to be precipitated by factors in the work environment. The condition forced both patients to stop working. Both were resistant to normal treatment with topical emollients and steroid creams; one was also resistant to immunosuppressive drugs. Newer biological drugs are registered in South Africa for the treatment of atopic dermatitis but are not affordable for the majority of patients. These patients illustrate the problem with adhering strictly to the literature guidelines when diagnosing atopic eczema in day-to-day practice. They also illustrate the possibility of adult-onset atopic eczema in an occupational setting. In both our patients, work factors seemed to precipitate its development, and they were initially diagnosed with occupational contact dermatitis.

Keywords: atopic eczema; atopic dermatitis; work-related dermatitis; irritant contact dermatitis; allergic contact dermatitis

Title: Occupational Lung Diseases in South African Miners at Autopsy: 2020 Surveillance Report

Author(s): Mhlongo, L.N., Wilson, K.S., Ngcobo, Z.B., Fassom, D., Murray, J., Lakhoo, D.G.

Source: Occup Health Southern Afr. 2023; 29(1):31-35

Abstract: The Pathology Division at the National Institute for Occupational Health (NIOH) provides autopsy services for deceased workers who worked in controlled mines or works under the provisions of the South African Occupational Diseases in Mines and Works Act, 1973 (Act No. 78 of 1973). This report describes the ages, commodities, employment durations, and occupational cardio-respiratory diseases in miners whose organs were submitted for autopsies in 2019 and 2020. Data were exported from the PATHAUT database into STATA for analysis. Differences in the proportions of disease (expressed per 1 000) were calculated using the Pearson's chi-square test; significance was set at $p \leq 0.05$. There were 759 and 557 records of deceased miners and ex-miners in 2019 and 2020, respectively. Pulmonary tuberculosis decreased from 192/1 000 in 2019 to 153/1 000 autopsies in 2020, and silicosis decreased from 246/1 000 to 223/1 000. However, neither decrease was significant. There was a significant increase in the rate of asbestosis from 50/1 000 in 2019 to 79/1 000 in 2020. Pulmonary tuberculosis (TB), emphysema, and silicosis were the most frequent diseases, with high rates. There was a non-significant decrease in occupational respiratory disease rates in 2020 from 2019, but these remain higher than the rates seen in the early 1990s. The NIOH continues to conduct autopsy surveillance on miners to support compensation for families, and the development of policy and intervention programmes in the mining industry

Keywords: PATHAUT; postmortem; silicosis; tuberculosis; mining

Title: Protecting Healthcare Workers during a Pandemic: What Can a WHO Collaborating Centre Research Partnership Contribute?

Author(s): Spiegel, J.M., **Zungu, M.**, Yassi, A., Lockhart, K., Wilson, K.S., et al.

Source: Rev Panam Salud Publica. 2023; 47:e33. https://doi.org/10.26633/RPSP.2023.33

Objectives: To ascertain whether and how working as a partnership of two World Health Organization collaborating centres (WHOCCs), based respectively in the Global North and Global South, can add insights on "what works to protect healthcare workers (HCWs) during a pandemic, in what contexts, using what mechanism, to achieve what outcome".

Methods: A realist synthesis of seven projects in this research program was carried out to characterize context (C) (including researcher positionality), mechanism (M) (including service relationships) and outcome (O) in each project. An assessment was then conducted of the role of the WHOCC partnership in each study and overall.

Results: The research found that lower-resourced countries with higher economic disparity, including South Africa, incurred greater occupational health risk and had less acceptable measures to protect HCWs at the onset of the COVID-19 pandemic than higher-income more-equal counterpart countries. It showed that rigorously adopting occupational health measures can indeed protect the healthcare workforce; training and preventive initiatives can reduce workplace stress; information systems are valued; and HCWs most at-risk (including care aides in the Canadian setting) can be readily identified to trigger adoption of protective actions. The C-M-O analysis showed that various ways of working through a WHOCC partnership not only enabled knowledge sharing, but allowed for triangulating results and, ultimately, initiatives for worker protection.

Conclusions: The value of an international partnership on a North-South axis especially lies in providing contextualized global evidence regarding protecting HCWs as a pandemic emerges, particularly with bi-directional cross-jurisdiction participation by researchers working with practitioners.

Keywords: Health occupations; COVID-19; occupational health; health consortia

Ms Danai Kwenda, SAFETP Resident, Epidemiology and Surveillance

Why did you choose this career?

I was introduced to the field of epidemiology whilst working at the NICD on a "One Health-related project on understanding Rift Valley fever in South Africa" as a medical technologist. In this project, scientists, technologists, entomologists, epidemiologists, nurses, medical and veterinary doctors worked together based on the One Health concept on how to tackle the burden of Rift Valley Fever in South Africa. I developed a keen interest in the distribution of diseases in the community and the underlying factors that cause them. Also, how to prevent and reverse the negative health outcomes on communities. Of particular interest to me is the focus on uncovering the distinct patterns and causes of disruptions in public health.

What training and qualifications did you undergo and where?

I have a BSc honours in Medical Laboratory Sciences from the University of Zimbabwe, postgraduate Diploma in Public Health from the University of Pretoria, BSc honours in Epidemiology and Biostatistics from the University of Pretoria and currently pursuing an MSc in Epidemiology and Biostatistics at the University of Pretoria.

What are the most enjoyable aspects of doing research?

The data analysis is the most exciting section. It's the section where I sharpen my statistical skills because there is always something new to learn.

Why did you choose this field of research?

To understand the dynamics of diseases and health-related events and implement preventative and control measures.

What are your research highlights to date?

Presenting my protocols at the NICD Scientific forum and NIOH Research forum.

What are your career goals?

To do a PhD in Public Health Epidemiology.

Occcupational health surveillance data provides vital information on the prevalence of occupational related diseases and injuries. It allows trends to be determined and prevention programmes to be monitored and evaluated. Thus surveillance of occupational exposures and health outcomes is an essential function of the NIOH.

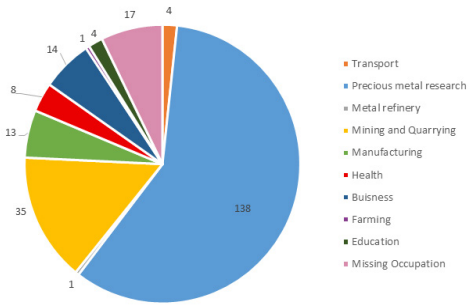
Occupational Allergy Surveillance 2022: Occupational Allergy Unit

Industrialisation is a cause of occupational allergies. Occupational allergies can lead to serious health problems and hence are compensable under the South African Compensation for Occupational Injuries and Disease Act of 1993 (Act 130, 1993). In certain industries where allergens are prominent, pre-employment screening is essential for preventing allergies resulting from workplace exposure. The NIOH provides a specialised occupational allergy service, which supports the Occupational Allergy Surveillance Programme.

There are two types of allergies investigated in the NIOH, skin and respiratory allergies. For skin allergies, patch tests are used to test for possible contact allergies. Testing was conducted using different batteries of commercial allergens (patch test series) and substances from the patient's workplace in 2022. Respiratory allergies were diagnosed using skin prick tests (SPT).

In 2021 the NIOH attended to 235 patients, 172 for respiratory allergies and 63 for skin allergies. Of the 63 patients who visited the occupational skin allergy clinic, 39 were tested for skin allergies. Of these clients, 44% were diagnosed with allergic contact dermatitis, 10% were diagnosed with allergic and irritant contact dermatitis, and 24% were diagnosed with irritant contact dermatitis only. The clients at the skin clinic consist of occupational referrals and private clients, 83% of the occupational referrals were diagnosed with a work-related disease and 14% of the private clients were diagnosed with a work-related disease.

Figure 1 Industries represented by number of clients in 2021.



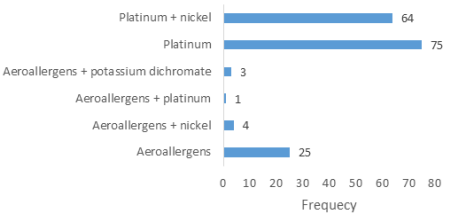


Figure 2 Number of skin prick tests requested by the allergen. The highest proportion of tests requested was platinum (44%), followed by platinum and nickel (37%) and aeroallergens (14.5%).

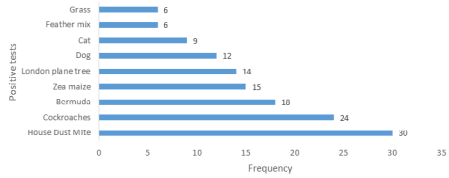


Figure 3 Proportion of clients that tested positive for common respiratory allergens by skin prick.

The most common positive aeroallergen in the NIOH Occupational Allergy Unit in 2022 was House Dust Mites followed by Cockroaches.
The most common test series performed for the patch testing was for the European Standard Series (ESS) with 62% of all patients tested, followed by the cosmetic series (4.8%).

The main industries that referred patients was precious metal research and development, followed by mining, quarrying, manufacturing, and business activities.

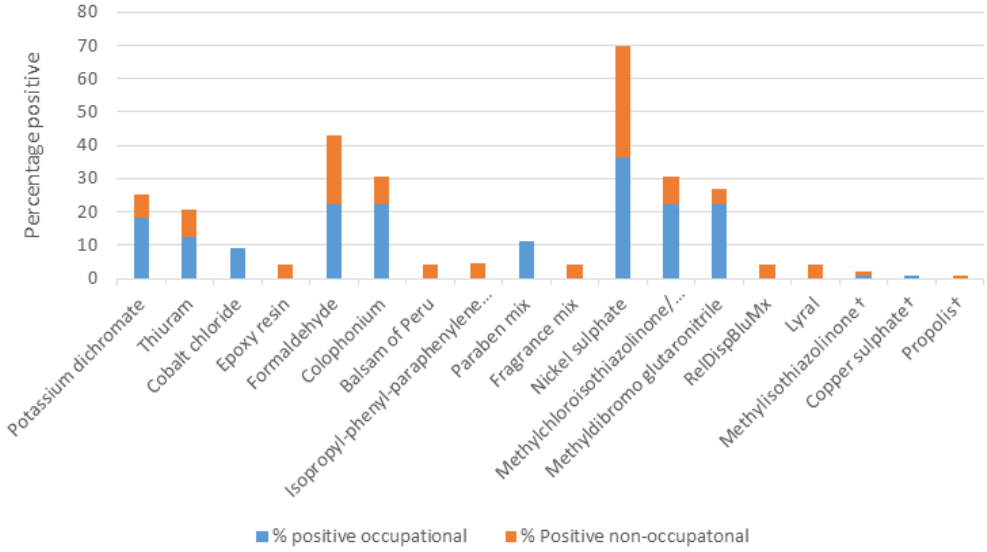


Figure 4 Percentage of clients testing positive for individual allergens in the European Standard Series

A large proportion (73%) of those tested were allergic to at least one of the substances tested in the ESS series. The top allergens identified were nickel, formaldehyde, colophonium (resin), methylisothiazolinone / Methylchloroisothiazolinone (preservatives in shampoos and other personal care products), and potassium dichromate (tanning, painting, printing and electroplating), among the occupational and private referrals. Half (51%) of the patients seen at the skin clinic reported atopy.

Conclusion

Surveillance of occupational allergies is essential as it helps identify putative agents and manage the risk of developing workplace allergies. This information can inform employers and raise awareness among workers. The results presented here highlight the need for more research and implementation of control measures in these industries. Since the COVID-19 pandemic there has been a decline in the number of referrals for allergy tests. Nonetheless, efforts must be made to strengthen the allergy surveillance programme across South African industries to provide a comprehensive picture.

SPECIALIZED SERVICE DELIVERY

The NIOH provides specialized and cost effective services in occupational health and safety through its multidisciplinary cohort. These services are provided to government departments (at national and provincial levels) and to various industries within Southern Africa. In this issue, we profile the work conducted by the HIV and TB in the workplace Unit in the informal sector.

Workers' health - Focus on HIV and TB for informal workers

According to the International Labour Organization (ILO), more than six in ten workers and four in five enterprises operate in the informal economy in the world, and these numbers are not slowing down. Workers in the informal economy do not have opportunities for work that is productive and deliver a fair income, security in the workplace, and social protection. Furthermore, this cohort of workers encounter challenges with better prospects for personal development and social integration, freedom to express their concerns, organize and participate in the decisions that affect their lives, and equality of opportunity and treatment for all women and men in the informal economy. It is known that in the informal economy:

1. Globally, 2 billion (61%) workers are in informal economy, while in Africa 85.5% of workers are in the informal economy;

2. About 63% and 58.1% of men and women, respectively, work in the informal economy worldwide;

3. In Africa 89.7% women and 82.7% men work in the informal economy;

4. The informal economy is broad and includes various jobs such as home-based workers, taxi driving, waste picking and street vending, agriculture, etc.

5. There is poor access and coverage of health services, and in particular occupational health services, which contributes to poor health outcomes for the informal economy workers. The nature and location of informal economy work usually pose a barrier to accessing health care services, including HIV and TB services;

6. Informal workers have a high risk of TB exposure due to socioeconomic and behavioural factors, with those exposed to silica dust (construction and manufacturing work) having an increased TB risk. Work conditions in the informal economy also make informal workers extremely vulnerable to HIV and TB exposure.

Recognizing the economic contribution, and health and safety challenges faced by informal economy workers, the NIOH working with partners such as the ILO and other informal economy stakeholders have collaborated to provide multiple services and resources on workers' health related to HIV and TB for informal economy workers. These include:

1. HIV and TB awareness campaigns

HIV and TB awareness campaigns aimed at street vendors and taxi drivers were conducted between 2016 and 2019 (as seen on picture below). These campaigns targeted the Johannesburg Fruit and Vegetables Market which has +/-1000 vendors, the Noord taxi rank in Johannesburg which mainly consist of taxi drivers and some vendors, and the Katlehong business club in the City of Ekurhuleni (CoE) which has about 500 registered vendors. The aim is to expand this initiative to areas outside the Gauteng Province. The awareness campaigns are conducted in collaboration with non-governmental organizations that provide targeted services such as HIV and TB health education, sharing of information, education and communication materials, HIV Counseling and testing (HCT) and TB screening, non-communicable diseases (NCDs) screening, and referrals for further management where appropriate.

Johannesburg Fruit and Veg market

2. Development of educational material for dissemination
Development of educational tools that are aimed at informal economy workers. These tools are presented in different formats and languages. Educational material can be accessed from the NIOH website https://www.nioh.ac.za/wp-content/uploads/2023/04/TB_and_HIV.pdf, https://www.nioh.ac.za/wp-content/uploads/2023/05/Management_of_HIV_and_TB_for_Informal_Workers.pdf, https://www.nioh.ac.za/fact-sheets/ and the audiovisual content can be accessed on the NIOH YouTube channel: https://www.youtube.com/watch?v=ZC_AeXSop7M.

3. Training on HIV, TB, Silicosis and Asbestos in the workplace
Provision of introductory workshops on HIV, TB, Silica dust exposure and Asbestos dust exposure in the construction industry (as seen on picture below). The workshops are targeted at small to medium enterprises (SMME) in the construction industry.

Training of SMMEs in the Construction industry.

4. Research in the informal economy

4.1 A situational analysis for a pilot HIV and TB workplace programme

The aim of this study was to gain knowledge on the work environment of street vendors and to assess their perceived needs for HIV and TB health services. This was a feasibility study for a pilot HIV/TB workplace programme for street vendors. The study was conducted over the period of 2017 to 2018, in collaboration with the NIOH Occupational Hygiene Section. A publication of the study is available on the NIOH website https://www.nioh.ac.za/hiv-and-tb-workplace-program-for-street-vendors-a-situational-analysis/.

4.2 A knowledge attitude practices (KAP) and HIV prevalence survey among farm workers

This study was conducted between 2018 – 2019, as an evaluation of HIV interventions that were implemented by the Partnership on HIV and Mobility in Southern Africa (PHAMSA), under the International Organization for Migration (IOM), through NGO's that provided HIV prevention services in the farms across Limpopo province (Figure 3). This study evaluated knowledge, attitudes and practices on HIV and TB among farm workers following the introduction HIV interventions in the farms. Some of the publications from this study are available on the NIOH website https://www.nioh.ac.za/factors-associated-with-tb-screening-among-agricultural-workers-in-limpopo-province-south-africa/.

For more information regarding these services contact:

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NIOH TRAINING CONDUCTED – JANUARY TO MARCH 2023

Global stats:
Two Occupational Health and Safety/COVID-19 training webinars were conducted during the period January to March 2023. These reached 1048 attendees, with an average of 524.0 attendees per webinar (63.5% female, 36.5% male).

NEDLAC & NIOH COVID-19 LEGACY TRAINING PROGRAMME

1. Second Nedlac/NIOH Webinar

The topic of the second webinar was “Minimum Occupational Health and Safety (OHS) service for a workplace”. The online training event was structured as a “live” panel discussion on Thursday, 9 March 2023.

The panellists included Dr Odette Volmink, Occupational Medicine Specialist, NIOH; Prof Muzimkhulu Zungu, Public Health Medicine Specialist, NIOH; Ms Michelle Morgan, Deputy Manager of National SHE Department, NHLS and Mr Puleng Mminele, National OHS Coordinator at the National Union of Metalworkers of South Africa (NUMSA).

The panellists outlined the process of setting up an occupational health service and practical application of OHS related law as applicable to the employer and the employee.

This webinar was attended by 371 participants (63.3% were female and 36.7% male) representing 301 workplaces.

Webinar video recording URL: https://www.youtube.com/watch?v=_WKeGtcqS_s

2. Third Nedlac/NIOH Webinar

The topic of the third webinar was "Compliance in Occupational Health and Safety (OHS)". The panel discussion was streamed "live" on Thursday, 30 March 2023 on the ZOOM platform.

The session panellists were Ms Bulelwa Huna, Senior Specialist: Occupational Health and Hygiene, Department of Employment and Labour (DoEL); Dr Jameson Malemela, Senior Vice President: Health and Employee Wellbeing, Sibanye-Stillwater; Ms Elray David, National Health Sector Coordinator: Education and Gender, Health and Other Service Personnel Trade Union of South Africa (HOSPERSA).

This webinar was attended by 677 participants (63.5% were female and 36.5% male) representing 525 workplaces.

Webinar video recording URL: https://www.youtube.com/watch?v=SCUEu4V5PzI

UPCOMING OHS TRAINING

1. NEDLAC/NIOH COVID-19 LEGACY PROGRAMME WEBINARS

a) Webinar #6: "COVID-19 Control measures - current practices"
Date: Thursday, 22 June 2023
Time: 10h00 – 10h30

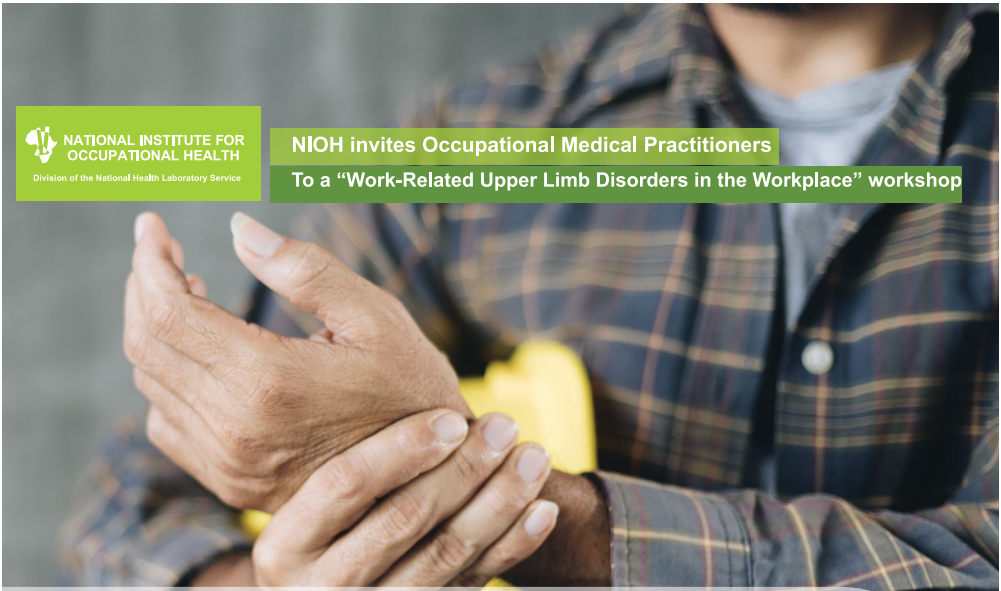
NB: The ZOOM link-to-register for the above panel discussion will be circulated to the NIOH stakeholder mailing lists.

2. OHS TRAINING

a) The NIOH Epidemiology & Surveillance Section is planning to run a 5-day course, i.e. five 2-hour sessions, on "Basic Epidemiology and Biostats Course" from Monday, 19 June to Friday, 23 June 2023.

b) The NIOH Occupational Medicine Section is planning to run a 2-day workshop for occupational medicine practitioners (OMPs) on "Work-Related Upper Limb Disorders (WRULD) in the Workplace" on Wednesday, 12 and Thursday, 13 July 2023.

Note:
The webinar topic, date and time may be subject to change. For further details, look out for the official NIOH webinar notices/invites. The webinar invitation and programme, including the ZOOM link-to-register, will be circulated in due course.



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

NIOH invites Occupational Medical Practitioners

To a "Work-Related Upper Limb Disorders in the Workplace" workshop

This workshop will empower you to:

- Gain an approach towards the assessment of ergonomic risk factors associated with WRULDs and the common WRULDs in the workplace.
- Increase awareness of and alignment with the current legislative framework pertaining to WRULDs in the workplace.
- Enhance the ability to screen the workplace for ergonomic risks that could lead to WRULDs.
- Develop an approach towards prevention and management of WRULD, including clinical investigation and management within the occupational health setting.

When : 12-13 July 2023
Where : PRF Building, National Institute for Communicable Diseases,
1 Modderfontein Road, Sandringham, Johannesburg

Cost : R3500 per participant | CPD Accredited

Click here to register: | Registration closing date: 5 July 2023

For more information email: occmedevents@nioh.ac.za

MANAGING WORKERS WHO TEST POSITIVE FOR COVID-19

Worker with no symptoms

- Continue working as normal.
- Take precautionary measures. This can include:

Avoid gatherings | Wash and/or sanitize hands regularly | Wear a mask | Clean workstation

Note: Does not apply to staff in health facilities and care homes where isolation may be required."

Worker with mild symptoms

- Isolate for 7 days from the start of symptoms.
- Take precautionary measures.
- Mild symptoms last only a few days and does not require hospitalization. They can include:

Cough | Fatigue | Fever | Headache | Sore throat

Worker with severe symptoms

- Isolate for 7 days from the date oxygen therapy is no longer required.
- Take precautionary measures.
- Severe refers to a person who is hospitalized or requires oxygen therapy or critically ill.

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Compensation Fund
WORKING FOR YOU

Information above is correct at time of printing 14/04/2023

FACT SHEET: CHOLERA RISKS IN OCCUPATIONAL SETTINGS

INTRODUCTION

Cholera is a highly infectious and severe diarrheal disease characterised by profuse watery diarrhoea, vomiting, and dehydration. This illness is caused by *Vibrio cholerae* (*V. cholerae*), a gram-negative, comma-shaped bacterium that thrives in water environments, particularly fresh warm, and brackish waters. The bacterium frequently causes outbreaks globally, particularly in areas with inadequate water, sanitation, and hygiene (WASH) services. This fact sheet provides an overview of *V. cholerae* and highlights the occupational health risks associated with this pathogen.

TRANSMISSION

Vibrio cholerae is spread through faecal-oral routes, including consumption of faecally contaminated food and water, transmission from contaminated environmental surfaces, and contact with cholera cases. However, this pathogen may be associated with a workplace or occupational setting, and specific work activities may predispose the worker to exposure if infection control measures are inadequate, resulting in an occupational infection.

SYMPTOMS

About 1 in 10 people with cholera may experience severe symptoms, which, in the early stages, include profuse watery diarrhoea, sometimes described as “rice-water stools”, thirst, extensive vomiting, leg cramps and restlessness or irritability. People with severe cholera can develop severe dehydration, which may lead to kidney failure. If left untreated, severe dehydration can lead to shock, coma, and death within hours.

OCCUPATIONAL HEALTH RISKS

Certain occupational groups may be at increased risk of exposure to *V. cholerae* due to their work environments and activities. These include but are not limited to:

Healthcare Workers: Healthcare workers (HCWs) treating cholera patients are at high risk of exposure to *V. cholerae* through direct contact with faecal matter or surfaces contaminated with patient faecal matter and/or other bodily fluids. Improper infection control practices, inadequate personal protective equipment (PPE), and poor sanitation and hygiene measures can further increase the risk of infection among HCWs.

Sanitation Workers: Workers involved in the sanitation management/value chain (collection, disposal, and treatment of human faecal waste) may encounter *V. cholerae* while handling contaminated human excreta. Exposure can occur during routine maintenance, repairs, or handling of wastewater without appropriate protective measures. Waste collection workers in both the formal and informal economies are also vulnerable to health risks such as cholera. Exposure may arise from touching contaminated waste material without proper PPE.

IMFS0038

Researchers and Laboratory Personnel: Laboratory workers studying *V. cholerae* or conducting experiments involving the bacterium may be at risk of exposure. Workers involved in detecting and identifying *V. cholerae* in diagnostic laboratories are also at risk of infection. Accidental spills, splashes, or improper handling of samples contaminated with the bacterium in a laboratory setting can lead to exposure.

Fishermen and Aquaculture Workers: Workers involved in fishing, shellfish harvesting, and other aquaculture activities may be at risk of *V. cholerae* infection as the bacterium can grow and reproduce in aquaculture water and small aquatic animals. Contact with contaminated water, seafood, or handling of infected aquatic species can lead to exposure and potential infection.

Disaster Response and Humanitarian Aid Workers: Workers providing emergency relief and aid in post-disaster areas (e.g. floods) and areas affected by cholera outbreaks may face an increased risk of *V. cholerae* infection. These workers often operate in resource-limited settings with compromised water and sanitation infrastructure, leading to a higher likelihood of exposure.

Food Handlers: Food handlers (street food vendors and restaurants) working in settings with poor hygiene practices and contaminated water sources may inadvertently contaminate food with *V. cholerae*. Consumption of contaminated food can lead to the spread of cholera among consumers and themselves.

TESTING WATER SAMPLES FOR *V.CHOLERAE*

The preferred method for sampling drinking water and other open water supplies is the collection of at least 1 Litre per sample to increase the chance of isolating *V. cholerae*, using sterile containers following aseptic techniques to prevent cross-contamination. Make use of sterile gloves during the collection of the sample. Alternatively, wash hands with soap and water before sample collection or sanitise with 70% alcohol-based hand sanitiser. When sampling treated water supplies, sodium-thiosulphate should be added to containers to inactivate the oxidising agents (incl. chlorine). Because *V. cholerae* survives better in specimens held at 4˚C than in frozen samples, specimens should be transported in an insulated box with ice packs (not loose ice as you risk contaminating the samples if the ice melts). Samples should be transported immediately to the laboratory, preferably within 24 hours. Submersion of samples in ice should also be avoided to prevent partial freezing of the samples. Contact the testing laboratory before sending specimens to confirm sample collection, transport and testing capacity.

PREVENTIVE MEASURES

The preventive measures should be implemented based on a comprehensive risk assessment and in conjunction with local guidelines, regulations, and occupational health and safety standards. Regular training, monitoring, and evaluation should be conducted to ensure compliance and to effectively prevent *V. cholerae* exposure in at-risk occupations. See Table 1 for preventive and control measures that may contribute to reducing workplace exposure.

CONCLUSION

Occupational exposure to *V. cholerae* can pose significant health risks for some occupations. By implementing appropriate preventive measures, such as infection control protocols, water treatment, and food safety practices, the risks of *V. cholerae* infection can be minimised. Employers, workers, and regulatory bodies must work together to promote a safe working environment and protect the health of those at risk of *V. cholerae* exposure.

Table 1 Preventive and control measures for selected high risk occupations

Controls	Description of prevention and control measures	Healthcare facilities	Sanitation	Laboratories	Fishing & Aquaculture	Disaster Response & Humanitarian Aid	Food handlers
Elimination	Water treatment plants should employ effective disinfection methods to eliminate *V. cholerae* from the water supply.		◆				
Substitution	Researchers should consider using suitable surrogate strains or attenuated strains for experiments.			◆			
Engineering	Use of appropriate containment measures (e.g. biosafety cabinets)			◆			
Administrative							
Standards, guidelines and protocols:	- Standard precautions and specific guidelines for handling cholera patients, including isolation protocols	◆					
	- Health & safety protocols and procedures including infection prevention and control	◆	◆	◆	◆	◆	◆
	- Procedure for handling and appropriate storage of products (e.g. cultures, food, aquatic life etc)			◆	◆		◆
Training:	- Cholera prevention, transmission and signs and symptoms of the disease	◆	◆	◆	◆	◆	◆
	- Infection prevention and control, and emergency response training (where relevant)	◆	◆			◆	
	- Hand hygiene and sanitation education and awareness.	◆	◆	◆	◆	◆	◆
	- Laboratory safety, including spill response and decontamination procedures			◆			
	- Correct selection and use of personal protective equipment (PPE).	◆	◆	◆	◆	◆	◆
	- Conduct public health education and training initiatives to raise awareness in the informal economy.		◆				
Hand hygiene & sanitation facilities:	Provide access to safe drinking water and adequate sanitation facilities in workplaces, including disaster-affected areas.	◆	◆	◆	◆	◆	◆
Waste disposal:	Ensure correct handling and disposal of contaminated materials (e.g. laboratory cultures and samples containing *V. cholerae*).	◆		◆			
PPE	Employers should provide appropriate PPE (e.g. gloves, respirators, goggles, waterproof boots) where relevant based on a comprehensive risk assessment.	◆	◆	◆	◆	◆	◆
Behaviour and Practices	Practice good hand hygiene and sanitation practices, including regular handwashing with soap and clean water.	◆	◆	◆	◆	◆	◆
	Practice safe handling of potentially contaminated materials.	◆	◆	◆	◆	◆	◆
	Use safe and potable water for food preparation, cooking and cleaning utensils.						◆
	Ensure proper cooking temperatures to eliminate *V. cholerae*. Store food at safe temperatures and avoid cross-contamination between raw and cooked food.						◆
	Encouraged to seek medical attention when displaying symptoms.	◆	◆	◆	◆	◆	◆

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OCCUPATIONAL SKIN DISEASES

OCCUPATIONAL SKIN DISEASES are among the most common work-related diseases in industrialised countries. They are under-diagnosed, under-reported and under-compensated and thus considered a "Hidden Epidemic". EARLY DETECTION, CORRECT DIAGNOSIS and appropriate TREATMENT can reduce sick leave, loss of skills and distress to the workers. Common occupational skin diseases include allergic and irritant contact dermatitis (80-90%), infections (bacterial, viral, fungal), urticaria, folliculitis/acne and cancers.

Allergic Contact Dermatitis

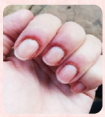

Allergy to rubber in gloves


Allergy to rubber in a respirator


Allergy to nickel


Chronic allergy to epoxy resins


Allergy & pigmentation to TCIC in powder paint


Chronic allergy to methacrylates coupled with an infection


Acute allergy to preservative in cooling water

Irritant Contact Dermatitis


Chronic irritant dermatitis with hypopigmentation


Chronic dermatitis resistant to treatment


Irritant shoe dermatitis


Acute dermatitis with abrasion from sandpaper


Irritant contact dermatitis in a chef

Other occupational skin diseases


Allergic dermatitis & bacterial infection


Fungal Sporotrichosis


Candida infection

Occupational skin infections


Contact Urticaria


Cancer


Folliculitis/Acne

Examples of occupations and substances causing occupational skin diseases

Occupation	Substances which can cause OSD
Construction workers	Cement, chromates, epoxy resins, wood dust, paints, varnishes, nickel, rubber, fiberglass, solvents, paint
Cleaners	Detergents, soaps, rubber gloves, polishes, fragrances, disinfectants
Health care workers	Anaesthetics, antibiotics, antiseptics, rubber gloves, preservatives, acrylate, detergents, disinfectants, water, soap
Hairdressers	Hair dyes, persulphate, nickel, fragrances, rubber gloves, permanent wave solutions, shampoos, bleaching agents, water

NIOH Occupational Skin Diseases Clinic

- Consultation with a dermatologist with experience in occupational skin diseases
- Patch testing for allergic contact dermatitis (specific series for different exposures)
- Specialised testing with workplace substances
- Comprehensive report with recommendations

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