



NATIONAL INSTITUTE FOR
OCCUPATIONAL HEALTH

Division of the National Health Laboratory Service

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OCCUPATIONAL



Act as if what you do makes a difference. It DOES

-William James



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MESSAGE FROM THE EDITOR

Dear reader,

A warm welcome to the winter edition of the NIOH OccuZone newsletter. The past quarter has been occupied by changes and adaptations to our new way of living and working. The recent lifting of the Disaster Management Act and the subsequent implementation of the Department of Employment and Labour's Code of Practice (managing exposure to SARS-CoV-2 in the workplace) has meant that Occupational Health and Safety (OHS) professionals and practitioners across the country have had to be flexible, accommodating and agile in their approach towards ensuring workplace health and safety.

Experts at the NIOH have continued to input and work closely with the National Department of Health, the Covid-19 OHS Workstream; the Department of Employment and Labour - Occupational Health and Hygiene Directorate; and stakeholders at the Nedlac Covid-19 Steering committee. In June 2022, the Government Gazette for the National Health Act - Surveillance and Control of Notifiable Medical Conditions Repeal, was signed by the Minister of Health, Dr MJ Phaahla. These developments have necessitated much consultation and reflection on the modified ways of working.

I am pleased to share with you the activities undertaken by the NIOH during the past quarter. The research focus of this edition centres around two key publications that will have significant impact in terms of the development of occupational health policies and vulnerability risk assessments for Healthcare workers (HCWs) related to the SARS-CoV-2 infection. Our spotlight focus is on Ms Ashley Chitaka, a Field Epidemiology Training program intern working in the Epidemiology and Surveillance Section. In this edition we cast a spotlight on Occupational Health Surveillance in South Africa, with specific focus on the Occupational Health Surveillance System (OHSS) and its importance for determining the human resource and economic impact of a particular pandemic or potential workplace exposure.

Our specialised service delivery focuses on the Electron Microscopy Unit, housed within the NIOH Pathology Division, and the specialised services it provides. We conclude this issue with a reflection on the training conducted and awards and recognition received by NIOH staff over the past quarter.

Grab a hot mug of cocoa with a good sprinkle of marshmallows, get under a warm blanket and enjoy the read!

Ms Shanaz Hampson



NEWSLETTER

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MESSAGE FROM THE RESEARCH COMMITTEE CHAIR



Occupational health has received significant attention recently on a global scale. On 28th April we celebrated the World Day for Safety and Health at Work under the theme: “Participation and social dialogue is vital in creating a positive health and safety culture”. This theme is crucial to promoting healthy, safe and sustainable workplaces especially at a time when disease outbreaks need to be mitigated.

This month, the World Health Organisation (WHO) sent out a call for experts to join the WHO Technical Advisory Group on Occupational Burden of Disease Estimation in an effort to support the production, publication and dissemination of its estimates of exposure to occupational risk factors and occupational burden of disease. The NIOH is already actively engaged with the WHO as a collaborating centre (CC), where there are currently 4 ongoing research projects on various aspects of occupational health. The first project focuses on supporting WHO’s work to identify and analyse lessons learned from the development and implementation of the national programme for occupational health related to health workers in South Africa. In this regard, the NIOH published a paper, i.e. Organizational factors associated with health worker protection during the COVID-19 pandemic in four provinces of South Africa. BMC health services research. 2021 Dec;21(1):1-5. <https://doi.org/10.1186/s12913-021-07077-w>. The second project aims to provide technical inputs to support the WHO’s work towards the development of the WHO/ILO global report on occupational health of health workers. The study on “Strengthening occupational health systems and services for health workers during the COVID-19 pandemic and beyond: the role of occupational health and safety information systems” is ongoing, where phases 1 and 2 have been completed, i.e. Pre-intervention baseline research and Intervention research. The third project focuses on support of WHO’s work on the informal economy, which centres on research and policy development. The informal economy survey has been completed and the results have been published in several international and national journals. The formal economy (workers at waste recycling buy back centres) study has also been completed. Post data analyses, the results for the formal economy as

well as comparisons between the informal and formal economy will be disseminated soon. The fourth project aims to provide technical inputs in support of WHO’s activities towards providing guidance and policy options for action by the health sector to improve health and safety of poor informal economy workers. This project will complete a systematic review on the intervention effectiveness and report on these case studies.

Networking activities related to projects 1 & 2 have included collaboration with the University of British Columbia (UBC). Networking related to project 3 included and networking related to project 3 included collaboration with Department of Employment and Labour and the International Labour Organization (ILO) focuses on the development of occupational health and safety guidelines and the related communication strategy on COVID-19 for the informal economy in South Africa. This is relevant because an ICOH Statement at the 110th Session of the International Labour Conference General Affairs Committee (#ILC2022; <https://bit.ly/3z9EqBw>) highlighted that Safety and Health (OSH) is a Fundamental Right at Work. This is a milestone to include OSH in ILO’s Framework of fundamental principles and rights at work. This will also give a great boost for OSH for health workers.

Dr Natasha Sanabria

RESEARCH

In the last quarter, two publications focusing on healthcare workers (HCW) were produced at the NHLS. These publications related to HCWs being the most vulnerable with regard to contracting severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. This is because medical laboratory workers may have an increased risk due to their interaction with biological samples received for testing and contamination of documents.

In the first study, records of COVID-19 laboratory-confirmed positive cases within the medical laboratory service were routinely collected in the company's Occupational Health and Safety Information System (OHASIS). Surveillance data from OHASIS were extracted from 1 April 2020 to 31 March 2021. An epidemic curve was plotted and compared for South Africa, along with prevalence proportions and incidence rates. The odds of COVID-19 infection were categorised by job and compared to the US Occupational Risk Scores. A logistic regression model assessed the risk of COVID-19 infection per occupational group. This study confirmed that some categories of medical laboratory staff were at increased risk for COVID-19, but it is a complex interaction between workplace risk factors, community interaction, socioeconomic status, personal habits, and behaviour. It was emphasised that the OHASIS tool has the potential to generate data for surveillance of health care workers and contribute towards a South African risk profile.

In the second study, the focus was on comorbidities (which have been reported to increase the risk for more severe COVID-19 outcomes) often requiring hospitalization. However, the evidence on disease severity and comorbidities among South African HCWs was found to be lacking. Therefore, a retrospective study was conducted to analyse the prevalence of comorbidities among HCW hospitalized with COVID-19 and its association with the severity of outcomes. Data from public and private hospitals in nine provinces of South Africa were extracted from the national hospital surveillance database for COVID-19 admissions. The risk of disease severity among HCWs was found to be increased with age. The most commonly reported

comorbidity was hypertension, followed by diabetes and obesity. Hypertension, diabetes, and HIV were significantly associated with disease severity. The information is important in light of future COVID-19 waves or similar outbreaks. The COVID-19 Surveillance on Hospitalized Health Care Workers (HCWs) week 24 of 2022 has recently been uploaded onto the NIOH website https://www.nioh.ac.za/wp-content/uploads/2022/06/COVID_HCW_Report_week24of2022_June_2022.pdf

The NIOH aims to build on these findings and help HCWs by evaluating NHLS staff experiences and work during the pandemic via an anonymous survey. This survey on the COVID-19 surveillance specifically in a healthcare worker population will investigate the use of Information Systems, the experience during COVID-19 exposure and infection, as well as vaccine uptake and hesitancy. The information is important in the development of occupational health policies and vulnerability risk assessments for HCWs.





Title: Dissolution kinetics of silver nanoparticles: Behaviour in simulated biological fluids and synthetic environmental media

Author(s): Mbanga O., Cukrowska E., and Gulumian M.

Source: Toxicology Reports 9 (2022) 788–796.

<https://doi.org/10.1016/j.toxrep.2022.03.044>

Abstract: Silver nanoparticles offer a wide range of benefits including their application in several fields such as medical, food, healthcare, consumer, and industrial purposes. However, unlocking this potential requires a responsible and coordinated approach to ensure that potential challenges emanating from the use of silver nanoparticles are being addressed. In this study, body fluids and environmental media were used to investigate the effects of citrate coated silver nanoparticles (cit-coated AgNPs) to mimic their behaviour in real life situations. Understanding the dissolution kinetics and behaviour of cit-coated AgNPs in simulated biological fluids and synthetic environmental media helps us predict their fate and effects on human health and the environment. The cit-coated AgNPs behaviour significantly varied in acidic and alkaline simulated fluids. Low pH and high ionic strength accelerated the rate and degree of dissolution of

AgNPs in simulated fluids. Following exposure to simulated fluids cit-coated AgNPs demonstrated significant changes in agglomeration state and particle reactivity however, the morphology remained unaltered. The slow dissolution rates observed for highly agglomerated cit-coated AgNPs in simulated blood plasma, Gamble's and intestinal fluids, and freshwater indicate that there is a greater likelihood that the particles will be the cause of the observed adverse effects. short-term effects. In contrast, the fast dissolution rates observed for citcoated AgNPs in simulated gastric and phagolysosomal fluid and synthetic seawater, the release of the silver ions at a fast rate, will be the cause of their short-term effects.

Keywords: Silver nanoparticles; agglomeration; dissolution kinetics; PH; synthetic; biological & environmental media

Topic: Priorities in Biobanking Research: A Report on the 2021 ISBER Round Table

Author(s): Byrne J.A., Banaszak, Carpenter J. E., Carroll S.L, Castelhana M.G., Espinal, P.S., Henderson M.K., Hettiaratchi A., Maseme M. et al.

Source: Biopreservation and Biobanking Volume 00, Number 00, 2022;

<https://doi.org/10.1089/bio.2021.0178>



Abstract As part of the 2021 ISBER meeting, we organized and participated in a roundtable forum to discuss research priorities in biobanking. Registration for this roundtable was made available to all ISBER members, regardless of whether or not they had registered for the ISBER 2021 conference. The roundtable was chaired by one of us (J.A.B.), and 60 participants from 20 countries registered to attend. This short report summarizes and extends the roundtable discussions to suggest how international biobanking organizations, including ISBER, can further support and grow the field of biobanking research. We have focused on three main pillars: research funding, workforce development, and biobanking research communication through conferences and publications. Biobanking research

provides an evidence base for the support of biobanking by gathering empirical data about biobank organization, operations, and research support. This initial roundtable discussion identified steps to promote biobanking research through funding opportunities, workforce development, conferences, and publications. Future activities could include regular roundtable discussions (supported for example by a Biobanking Research Working Group) that should extend across different biobanking organizations to ensure an international approach to biobanking research.

Keywords: Biobanking research; research funding; workforce development; conferences; publications

Title: Exposure Assessment of Silver and Gold Nanoparticles Generated During the Synthesis Process in a South African Research Laboratory



Author(s): Masekameni M. D., Andraos C., Yu I.J., Gulumian M.

Source: Front. Toxicol., 25 May
<https://doi.org/10.3389/ftox.2022.892703>

Abstract: During the synthesis of engineered nanomaterials (ENMs), various occupational exposures occur, leading to health consequences. To date, there is paucity of studies focused on modeling the deposition of nanoparticles emitted from ENMs synthesis processes. This study aimed to characterise and assess exposure to gold (AuNPs) and silver nanoparticles (AgNPs) during a synthesis process in a research laboratory in South Africa. AuNPs and AgNPs synthesis processes were monitored for an hour in a laboratory using a Scanning Mobility Particle Sizer. The monitoring was conducted at a height of 1.2–1.5 m (m) and 1.5 m away from the hood, assuming a 30 cm (cm) breathing circumference zone. Each synthesis process was monitored thrice to generate reliable point estimates, which were used to assess exposure over 8 hours. A time-weighted average concentration was calculated and compared to the derived 8-h occupational exposure limit (OEL) for AgNPs (0.19 µg/m³) and the proposed provisional nano reference value for AuNPs (20,000 particles/cm³). The Multiple-Path Particle Dosimetry model was used to calculate the deposition and retention of both AuNPs

and AgNPs. NPs emitted during the synthesis process were dominant in the nuclei (79% for AuNPs and 54% for AgNPs), followed by the Aitken (12% for AuNPs and 29% for AgNPs), with fewer particles in the accumulation mode (9.2% for AuNPs and 17% for AgNPs). AuNPs and AgNPs generated during the synthesis process were determined at 1617.3 ± 102 cm³ (0.046 µg/m³) and 2,687 cm³ ± 620 (0.077 µg/m³), respectively. For the three exposure scenarios, none exceeded the occupational exposure limit for both AuNPs (provisional) and AgNPs (OEL). Workers in the synthesis laboratory are exposed to a concentration below the recommended occupational exposure limit for silver and the proposed provisional nano reference value for gold. Although, the concentrations to which laboratory workers are exposed to are below safe levels, the assessment of the lung deposition patterns indicate a high particle lung retention which raise concerns about long term safety of workers.

Keywords: OEL; SMPS; Aitken; MPPD model; nanoparticles

Title: Contact Dermatitis in a Cosmetologist and the Ramification of Occupational and Non-Occupational Exposures in Disease Prognosis



Author(s): Fourie A., Singh T.

Source: A Current Allergy & Immunology. June 2022. Vol 35, No.2.
<https://allsa.org/caci-volume-35-issue-2/>

Abstract: Cosmetologists may specialise in different types of beauty treatment, including hairdressing, the application of cosmetics, manicures or pedicures (including nail adornment) and body massage therapy. In this case, a 27-year-old cosmetologist with work-aggravated contact dermatitis is discussed. She developed severe contact dermatitis of the hands. The case illustrates the challenges in determining whether the condition is occupational or work-aggravated, which is important in limiting exposure to the causative agent. As the reactions were around her fingernails and on her fingers and she worked with hairdressing chemicals, the patient was asked to submit herself to testing to determine whether she was sensitised to the chemicals used in hairdressing and/or nail treatment or adornment processes.

Using both hairdressing and meth(acrylate) series of patches, patch tests were done to determine whether the hairdressing products she used regularly and/or the acrylate-based nail products, which are applied to both her clients' and her own nails, were the causative agents. Sensitisation to substances from both series was detected and the chemicals were found in both the products used in the workplace and those for personal use. The importance and the complexity of managing patients with both occupational and non-occupational exposures are highlighted in this study.

Keywords: Cosmetologist; hairdressing; contact dermatitis; occupational exposure; non-occupational exposure



Title: COVID-19 Cases Among Medical Laboratory Services Staff in South Africa, 2020–2021: A Cohort Study.

Author(s): Wilson K.S., Ntlebi V., Made F., Sanabria N., Vetten M., Joseph J., et al.
Source: PLoS ONE 17(6): e0268998.
<https://doi.org/10.1371/journal.pone.0268998>

Abstract: Medical laboratory workers may have an increased risk of COVID-19 due to their interaction with biological samples received for testing and contamination of documents. Records of COVID-19 laboratory-confirmed positive cases within the medical laboratory service were routinely collected in the company's Occupational Health and Safety Information System (OHASIS). Surveillance data from the OHASIS system were extracted from 1 April 2020 to 31 March 2021. An epidemic curve was plotted and compared to that for the country, along with prevalence proportions and incidence rates. The odds of COVID-19 infection were categorised by job and compared to the US Occupational Risk Scores. A logistic regression model assessed the risk of COVID-19 infection per occupational group. A total of 2091 (26% of staff) COVID-19 positive cases were reported. The number of COVID-19 cases was higher in the first wave at 46% (967/2091)

of cases, than in the second wave 40% (846/ 2091) of cases. There was no significant difference in COVID-19 prevalence between male and female employees. The job categories with the most increased risk were laboratory managers [AOR 3.2 (95%CI 1.9–5.1)] and laboratory support clerks [AOR 3.2 (95%CI 1.9–5.2)]. Our study confirms that some categories of medical laboratory staff are at increased risk for COVID-19; this is a complex interaction between workplace risk factors, community interaction, socioeconomic status, personal habits, and behaviour. Targeted interventions are recommended for high-risk groups. OHASIS has the potential to generate data for surveillance of health care workers and contribute towards a South African risk profile.

Keywords: COVID-19; medical laboratory workers; odds of infection; occupation; OHASIS; 2020–2021

Title: Mechanisms facilitating the uptake of carboxyl-polythene glycol-functionalized gold nanoparticles into multicellular spheroids

Author(s): Fobian S.F., Petzer M., Vetten M., Steenkamp V., Gulumian M., and Cordier W.

Source: Journal of Pharmacy and Pharmacology, 2022, XX, 1–14.
<https://doi.org/10.1093/jpp/rgac017>



Abstract: Nanomedicines represent theragnostic alternatives to traditional candidate drugs, with increased targeting and delivery potential due to their size and functional tailorability. Biological activity typically relies on nanomaterials permeating into the intracellular environment, necessitating characterization of uptake and intracellular trafficking pathways. Spheroids' three-dimensional architecture and heterogeneous cellular distribution offer an in-vivo-representative platform to assess the biological activity of nanoparticles (NPs). This study aimed to develop an A549 alveolar carcinoma spheroid model as a NP uptake assessment platform for carboxyl-polythene glycol-functionalized gold NPs affording further biological characterization opportunities in nanomedicine. In terms of methodology, A549 spheroids were generated via the liquid overlay method, and their morphology and viability were assessed for 21 days. Cytotoxicity was assessed via lactate dehydrogenase release. NP uptake was elu-

cidated using uptake pathway inhibition, combined with CytoViva hyperspectral imaging of sectioned spheroids to count internalized NPs. From key findings it was noted that cytotoxicity was absent for all exposure groups. Clathrin-mediated endocytosis was the primary endocytic mechanism (33.5– 54.8% of uptake), which may precede lysosomal degradation. Lysosomal membrane permeabilization appears to be a potential downstream application. Low penetration into spheroids (4.5 μ m) suggests the failure of NPs to traverse cellular layers in the spheroid. Although poor uptake was observed, a multicellular spheroid model of A549 alveolar carcinoma cells was established, allowing for similar future uptake assessment of various NPs.

Keywords: Clathrin-mediated endocytosis; CytoViva; gold nanoparticles; nanomedicine; spheroids; uptake

Title: Disease Severity and Comorbidities among Healthcare Worker COVID-19 Admissions in South Africa: A Retrospective Analysis

Author(s): Ratshikhopha E., Muvhali M., Naicker N., Tlotleng N., Jassat W. and Singh T.
Source: Int. J. Environ. Res. Public Health 2022, 19, 5519.
<https://doi.org/10.3390/ijerph19095519>

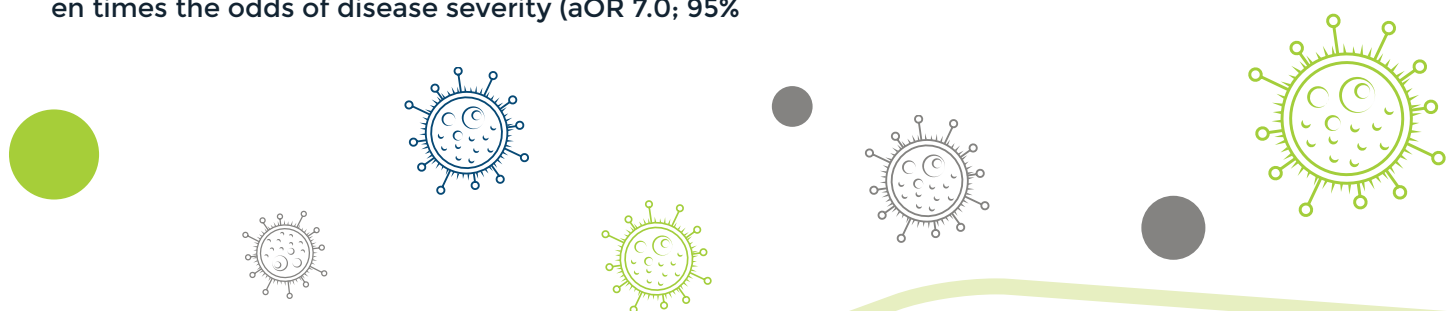


Abstract: Healthcare workers (HCWs) are among the most vulnerable in regard to contracting severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. Comorbidities are reported to increase the risk for more severe COVID-19 outcomes, often requiring hospitalization. However, the evidence on disease severity and comorbidities among South African HCWs is lacking. This retrospective study analysed the prevalence of comorbidities among HCW hospitalized with COVID19 and its association with the severity of outcomes. Data from public and private hospitals in nine provinces of South Africa were extracted from the national hospital surveillance database for COVID19 admissions. A total of 10,149 COVID-19 HCWs admissions were reported from 5 March 2020 to 31 December 2021. The risk of disease severity among HCWs increased with age, with those older (≥ 60 years) having seven times the odds of disease severity (aOR 7.0; 95%

CI 4.2–11.8) compared to HCWs in the younger age (20–29 years) group. The most commonly reported comorbidity was hypertension (36.3%), followed by diabetes (23.3%) and obesity (16.7%). Hypertension (aOR 1.3; 95% CI 1.0–1.6), diabetes (aOR 1.6; 95% CI 1.3–2.0), and HIV (aOR 1.6; 95% CI 1.2–2.1) were significantly associated with disease severity. In conclusion, age, gender, and existing comorbidities were strong predictors of the prognosis of severe COVID-19 among HCWs in South Africa. The information is important in the development of occupational health policies and vulnerability risk assessments for HCWs in light of future COVID-19 waves or similar outbreaks.

Keywords:

Coronavirus; risk factors; comorbidities; vulnerable; disease severity; health outcomes



Ashley Chitaka

Epidemiology Intern, Epidemiology and Surveillance Section

Ashley Chitaka is a Field Epidemiology training program intern based at the NIOH participating in a research project in the epidemiology and surveillance unit. The project focuses on the role of job level on psychological distress of health workers along with a surveillance analysis centred on diabetes mortality and occupation. She will also be involved in evaluating the Occupational Health Surveillance System (OHSS) established at the NIOH during COVID19.

Why did you choose this career and research path?

From a young age, I knew that I wanted to pursue a career in the Health Sciences field and I did so. I studied a health related degree program that is dynamic and with multifaceted career opportunities that develop a person in numerous ways. I have always enjoyed serving in this field. This career is not stagnant, but a constantly evolving one especially in Public Health. I chose this career because in addition to helping people with new knowledge, the career allows one the opportunity to travel and learn about other cultures and how to interact with them which makes it easier to handle public health burdens without violating ethics. Occupational health, I believe is a field that is yet to still make its permanent mark in Public Health or in the health field in general. Similar to NCDs that are hardly focused on, I thought it would be important to conduct my research in this field. I hope that by so doing, this research will be among the many that are researched to help the field of Occupational Health stand out, and be recognized as an important field like any other health related field.

What training and qualifications did you undergo and where?

I completed a Master of Science in Field Epidemiology from the University of Witwatersrand, a Honours degree in Public Health from Monash University; a Bachelor of Science in Public Health from Monash University; and a Safety Management Training Course from the National Occupational Safety Association Training Institute in Centurion.

What are the most enjoyable aspects of doing research?

I enjoy every research conducted. There is always a new thing to learn, new associations or new disease causal pathways that I might have not known. I also enjoy working on a statistical data analysis software (STATA) to produce outcomes that speak to health situations.

What are your research highlights to date?

In addition to writing my full BPH Honours degree thesis, my research highlights to date are; participating in two investigations of public health problems (outbreaks). Secondly I have also participated in two Knowledge, Attitudes and Practices (KAP) studies (in Mpumalanga and Free State) from the primary data collection phase through to the dissemination of results to the stakeholders.

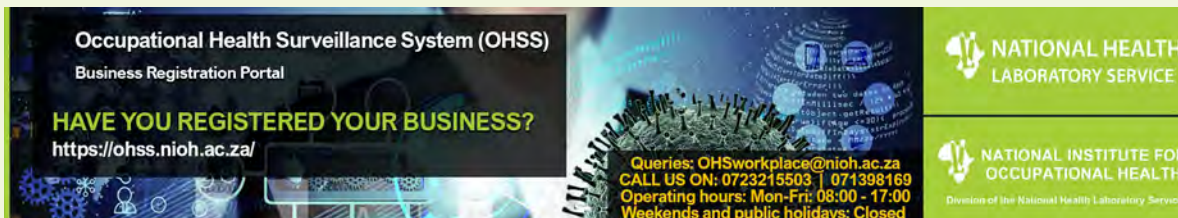
What are your career goals?

After my masters, I would like to advance my career by studying further and try to work on getting a PHD. However, I see myself growing into a Head lead of a very renowned, impactful Public Health institution.

Occupational health surveillance data provides 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. In this issue, we present a discussion on occupational health surveillance in South Africa touching on the benefits of the Occupational Health Surveillance System (OHSS) managed by the NIOH.



OCCUPATIONAL HEALTH SURVEILLANCE IN SOUTH AFRICA



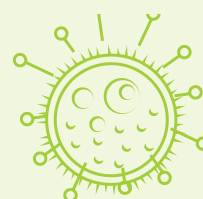
To improve South African occupational health and safety, information on the current state of occupation related injuries and diseases, and the continued evaluation of prevention of injuries and diseases at workplace and industry level is required. The International Labour Organization (ILO) reports that more than 340 million work related accidents occur each year, with unsafe workplaces contributing to about 2.3 million of reported mortality. Nonetheless, monitoring of workplace related injuries and diseases requires an ongoing systematic collection or reporting and analysis of data through an effective national occupational injuries and diseases surveillance system. At the moment, South Africa does not have a national occupational injuries and disease surveillance system.

Collection of information on occupational injuries and disease in South Africa is fragmented and under separate laws. These include the Occupational Health and Safety Act 85 of 1995 (OHS Act); Compensation for Occupational Injuries and Diseases Act 130 of 1993 (COID Act); Mine Health and Safety Act 29 of 1996 (MHS Act); Occupational Diseases in Mines and Works Act 208 of 1973 (ODMW Act); National Nuclear Regulator Act 47 of 1999; National Railway Safety Regulator Act 16 of 2002; Civil Aviation Act 13 of 2009; South African Maritime Safety Authority Act 5 of 1998. Both workers and employers have a responsibility and a legal requirement to report incidents, injuries and diseases to the relevant authorities in these acts.

While the above laws collectively allow for the reporting and collection of occupational injuries and diseases data. The reporting of occupational injuries and diseases for compensation purposes is covered by the COID Act under the Department of Employment and Labour's Compensation Fund and the ODMW Act under the National Department of Health's Medical Bureau for Occupational Diseases. These are the two main sources of occupational injuries and diseases data that active, however, there are no publicly available reports from either entity on burden of compensated occupational injuries and diseases in South Africa.

While, the inspectorates of MHS Act under the Department of Mineral resources and Energy provides reports on occupational injuries and diseases from the mines in its annual report, the Department of Employment and Labour's inspectorate does not receive similar data from practitioners and thus unable to report on suspected occupational injuries and diseases. This leaves a gap in the information available in South Africa for prevention of workplace injuries and disease.

SURVEILLANCE



OCCUPATIONAL HEALTH SURVEILLANCE SYSTEM (OHSS)

The Occupational Health Surveillance System (OHSS) was designed to support occupational health surveillance in workplaces. The Coronavirus diseases (COVID-19) surveillance was implemented as a digital platform to collect information on COVID-19 positive cases, employee symptom screening, contact tracing, and post infection or return to work data for workers in private and public sectors. Despite the expiry of the declaration of the National State of Disaster, COVID-19 cases continue to be transmitted in communities and workplaces. To this end, the Code of Practice: Managing exposure to COVID-19 in the workplace 2022 has been promulgated to replace Regulations and the Direction on Occupational Health and Safety Measures in Certain Workplaces, which were as a result of the declared state of disaster in line with the Disaster Management Act, 2002 (Act No. 57 of 2002).

The reporting of symptoms and isolation of employees with COVID-19 remains in the updated code of practice along with a requirement for employers to undertake a risk assessment for COVID-19 exposure. COVID-19 is now classified as a group 3 hazardous biological agent in the Regulations for Hazardous Biological Agents of 2022. Although reporting to the OHSS system is voluntary, the collection of the information by workplaces is found in the guide. This includes the collection of employees' vaccination statuses.

Reporting to the OHSS provides a number of benefits to South Africa and companies in terms of timeous responses to occupational health threats and to prevent future (disease) outbreaks in workplaces. Furthermore, reporting allows estimates of disease burdens and to enhance appropriate primary prevention strategies and response at local and national level. OH Surveillance may also identify populations at risk of injuries and diseases and to inform policy development to support productive work and social support where required.

Approximately 13083 employees screened symptomatic during this period. The most common symptoms were lack of smell or taste (22%) followed by sore throat, muscle pains and headache (15.0% each) (Figure 2).

THE BENEFITS OF STILL REPORTING ON OHSS:

At the moment, the OHSS is intended to monitor COVID-19 infection in workplaces. This information can provide trends for the spread of the disease/infection in different occupational groups and job categories. This can provide information on where resources should be located for controlling transmission or spread of the disease within the coun-

try and for preventative measures to protect the health of the workers.

South African businesses will benefit from the OHSS as it allows for the early identification of high-risk job categories/employees; the identification of high risk sectors in terms of disease and also exposure; the monitoring of trends and allowing for the evaluation of interventions that have been put in place. These types of surveillance systems can also assist with determining the human resource and economic impact of a particular pandemic or potential workplace exposure to a company or across a certain sector. With a live dashboard, the OHSS is also capable of providing a trajectory of the pandemic/exposure to businesses across various economic sectors in South Africa.

Upstream informed interventions that protect and promote worker health and safety become possible when a robust well established surveillance system is in place and the NIOH intends to build upon the existing foundations of the OHSS. This will be for the purpose of conducting broader surveillance on all occupational diseases and injuries in South Africa in the future.

ACCESS TO REPORTS AND THE SURVEILLANCE DASHBOARD:

The COVID-19 surveillance reports on Healthcare workers (HCW's), produced by the NIOH, are based on data from the National Institute for Communicable Diseases (NICD).

Click here to view past reports:

<https://www.nioh.ac.za/covid-19-occupational-health-surveillance/>

The OHSS dashboard is available on our website via the link:

<https://datastudio.google.com/embed/u/0/reporting/bd5b8307-e349-418d-af3b-39b34bff6607/page/jfi1B>

Read more about the OHSS here:

<https://www.nioh.ac.za/covid-19-information-resources/occupational-health-surveillance-system-ohss-business-portal/>

CONTACTS

All general and IT support queries related to the OHSS system can be directed to:

OHSworkplace@nioh.ac.za

Contact us via telephone: 0723215503 | 0713981169

Operating hours

Mon-Fri: 08:00 – 17:00

Weekends and public holidays: Closed

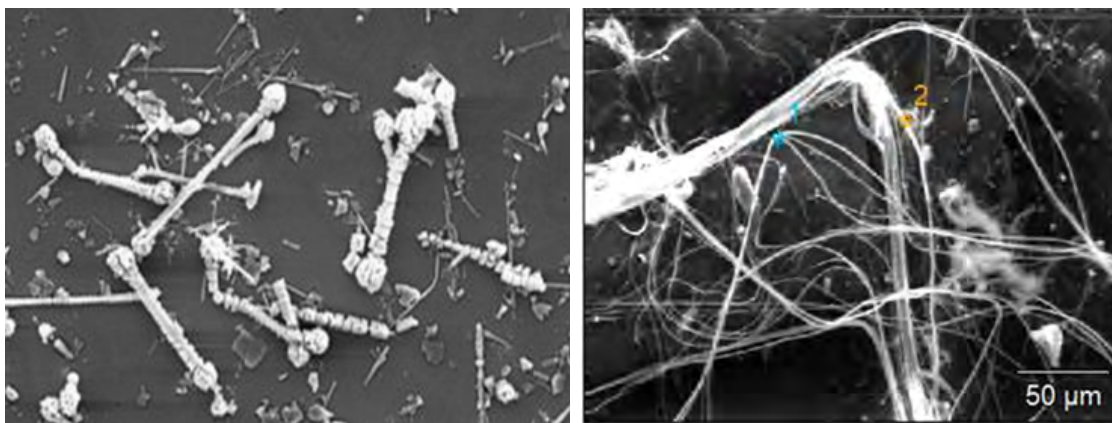
The NIOH continues to provide discipline-specific services to many industrial sectors and government departments. The unique, extent and diversity of these services offered, many of them are limited or unavailable elsewhere in the country. Here we showcase a unique specialised service in electron microscopy service by the NIOH Pathology Division.



ELECTRON MICROSCOPY SERVICE

The Electron Microscopy (EM) Unit is an essential component in the NIOH's Pathology Division, and its function is to assist in service delivery, research and training.

The unit is equipped with a scanning electron microscope (SEM). The microscope is linked to an energy dispersive spectroscopy (EDS) analyser, which analyses the chemical composition of asbestos and other various molecules. The SEM technique is regarded as the gold standard for asbestos fibre analysis. Currently, the EM NIOH unit is the only public laboratory offering this service in the country. Our clientele list includes South African national, provincial and local government, non-governmental organisations (NGOs), universities, private businesses and neighbouring Southern African Development Community (SADC) countries.



Scanning electron micrograph showing asbestos fibres and asbestos bodies (left). When analysed by EDS, the fibres exhibited peaks for silica, iron and magnesium, identifying them as Amosite asbestos. The above sample was from the lung of an ex-asbestos miner who worked at a mine in Limpopo. The picture on the right is of a bulk sample from a residential area in Gqeberha (Port Elizabeth). When analysed by EDS, the curved fibres exhibited peaks for silica and magnesium, identifying them as Chrysotile asbestos.

Asbestos fibres and asbestos bodies in the lungs of deceased ex-miners have been analysed to assist with the compensation process since 1975 in terms of the Occupational Diseases in Mines and Works Act, 1973, hence the pathologists' use of SEM has a significant legal impact in the country.

The primary focus of the unit is environmental and occupational asbestos exposure. These include bulk and air samples.

Air and bulk asbestos samples might be taken by an Occupational Hygienist from the NIOH Occupational Hygiene Section during an exposure or health risk assessment survey to assess workers or communities potential exposure to the fibres.

This service has also been pivotal in implementing the 2002 Asbestos Regulations (and currently the 2020 Asbestos Abatement Regulations) to identify asbestos in building materials and enumerate asbestos fibres in the air. In terms of the regulation, it is required to assess the exposure risk to workers whenever work on asbestos-containing materials (ACM) is taking place. Environmental asbestos samples are often taken to assess the potential risk to the public after work on ACM, such as removal or renovation. Once this has been completed, it is necessary to ensure that no air or soil contamination has occurred during these processes. The samples are analysed to assess the presence of asbestos in work and residential areas to determine the risk of developing asbestos-related diseases.

SPECIALIZED SERVICE DELIVERY

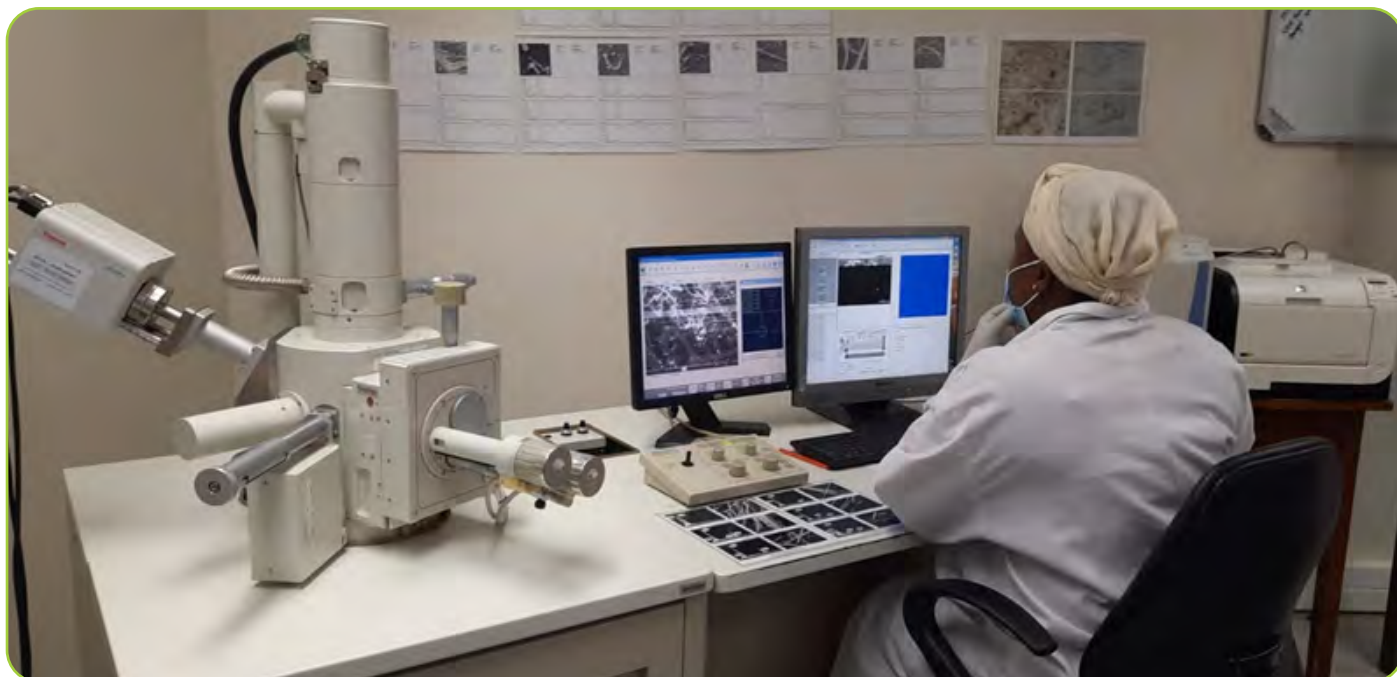


Image 1: Ms L Mhlongo analysing an asbestos sample using the EM.

The data collected and generated from the analyses of the samples is entered into a database. From this database two surveillance reports are generated annually, i.e. the Pathology Division Surveillance (PATHAUT) and Asbestos Reports. This database is unique in South Africa and its interrogation provides crucial information about the legacy of asbestos in the country. To date, more than 4000 entries have been captured into the industrial database with details including the type of sample, area of origin, industrial sector, and the activity that was performed, for example, renovation of an asbestos-containing structure.

Scientists and pathologists working in the Electron Microscopy Unit also conduct asbestos research and training in collaboration with universities, the NHLS and other divisions within the NIOH. The section has also collaborated with researchers from other countries including the United States of America and the United Kingdom.

To ensure that accurate and precise results are generated, the EM Unit participates in an external quality assurance scheme and has maintained its satisfactory rating for asbestos in materials international quality assurance scheme coordinated by the Health and Safety Laboratory, UK.

The Annual Asbestos Reports can be accessed through the NIOH website at the following URL: <http://www.nioh.ac.za/asbestos-surveillance-reports/> and the annual PATHAUT Reports can be accessed through the NIOH website at the following URL: <https://www.nioh.ac.za/pathology-disease-surveillance-reports/>

For more Information about the Electron Microscopy service and request for analysis quotation, please contact:

Ms. Lucia Mhlongo (Medical Scientist) 011 712 6465 | LuciaM@nioh.ac.za

Ms. Zethembiso Ngcobo (Medical Scientist) 011 712 6465 | ZethembisoN@nioh.ac.za

Dr. Deepna Govind Lakhoo (Pathologist and Head of Section) 011 712 6409 | DeepnaL@nioh.ac.za

For advice on workplace asbestos risk assessment, air monitoring and asbestos counting using Phase Contrast microscopy (HSC 248 method), please contact:

Mr. Gabriel Mizan (Occupational Hygienist, NIOH Occupational Hygiene Section):
011 712 6457 | GabrielM@nioh.ac.za

Ms. Jeanneth Manganyi (NIOH Occupational Hygiene Section Head): 011 712 6406 | JeannethM@nioh.ac.za

Since the outbreak of COVID-19 in South Africa in March 2020, the NIOH has carried out over 100 training sessions for different industries in both the formal and informal sectors. Many of these sessions were training for essential services, government and frontline workers, the informal sector and private companies on COVID-19 related subjects. These training sessions were undertaken under the auspices of the NIOH's COVID-19 Occupational Health Outbreak Response Team (OHORT). They covered updates on the virus and critical topics like national regulatory requirements; roles and responsibilities in the workplace; risk assessments; routes of transmission; preventative/control measures; the proper usage of PPE and face masks; cleaning and decontamination processes; ventilation, vaccines and vaccination in the workplace; how to deal with positive cases in the workplace; potential sources of exposure and mental health to name a few.

In this issue, we look at the training activities undertaken by the institute during the last quarter.



TRAINING CONDUCTED

Global stats: 100 COVID-19 webinars; 54'460 attendees



COVID-19 Webinar: The new COVID-19 guidelines - The evolution of Workplace Directives (Tue. 12th April 2022)

The NIOH Training Unit conducted this COVID-19 vaccine webinar for the broad OHS stakeholder community. The fluidity in the adjustments and amendments of the workplace-focused directives and guidelines related to COVID-19 generated heightened interest in the occupational health and safety (OHS) community.

The presenters were Sr Angela Butkovic (SASOHN Executive Member & Honorary Life Member) and Sr Yvonne van Zijl, both Occupational Health Nursing Practitioners. The OHN practitioners presented on "The Practical Experience adapted in the OH Setting by OHPs, as guided by the rapidly evolving National Department of Health (NDoH) Directives on Covid Screening". The third presenter was Dr Itumeleng Ntamatama (Occupational Medicine Specialist, UCT) on "Managing exposure to Sars-Cov-2 in the Workplace: updated guidelines/regulations".

The target participants included occupational medicine and nursing practitioners; occupational health and safety (OHS) professionals; advisors and practitioners; employers and management representatives; trade union representatives; SHE representatives; employee health and wellness coordinators; and human resource practitioners.

811 attendees joined the webinar.

COVID-19 Centenary Webinar: SARS-CoV-2/COVID-19 - Strengthening Occupational Health Resilience for National Epidemic Response for South African Workplaces (Thu. 21st April 2022)

<https://youtu.be/XsxqHyT9TZM>

Professor Eric Buch, Chairperson of the National Health Laboratory Service (NHLS) Board of Executives, opened the NIOH's COVID-19 Centenary Webinar. Prof Buch shared the national contributions of the NHLS in response to the COVID-19 pandemic; the challenges it faced and the extent of the resources that it had saved over the period.

Prof Buch gave recognition to the NIOH for its leading role and contribution at the forefront of the occupational health field, for being "on top of your game" and fulfilling its national responsibilities, as well as its contribution towards fulfilling the NHLS's public health and occupational health responsibilities.

Prof Buch acknowledged the NIOHs' role in the national emergency epidemic response support of South African workforce and workplaces. He congratulated the NIOH for the level of excellence it demonstrated in providing continued advice and support for prevention and pandemic preparedness in the workplace, and for achieving the awareness-raising milestone of the 100th COVID-19 training session. The NIOH staff was acknowledged for the exceptional work done.

NIOH Executive Director, Dr Spo Kgalamono, welcomed speakers and webinar participants, acknowledged the leadership, guidance, and continued support received from the NHLS Board and management. Dr Kgalamono particularly thanked the NIOH's partners for their contributions to the COVID-19 webinar series culminating in the 100th Centenary Webinar. She made special mention of the role of the NIOH's COVID-19 Occupational Health Outbreak Response Team (OHORT) under the leadership of Dr Tanusha Singh and the NIOH OHS Training Team in fulfilling the institution's national mandate.

Following Prof Buch and Dr Kgalamono's opening and welcome, the 6.5-hour webinar was addressed by the speakers listed below:

- Prof Koleka Mlisana (NHLS Executive Manager: Academic Affairs, Research & Quality Assurance)
- Dr Tanusha Singh (NIOH COVID-19 Occupational Health Outbreak Response Team / OHORT)
- Dr Barry Kistnasamy (National Department of Health National COVID-19 OHS Work Stream).
- Ms Aggy Moiloa (Deputy Director General / Inspector General, Department of Employment & Labour)
- Mr David Msiza (Chief Inspector, Department of Mineral Resources)
- Dr Ivan Ivanov (Head, Occupational and Workplace Health, World Health Organisation / WHO)
- Prof Salim Abdool Karim (CAPRISA Director; CAPRISA Professor of Global Health, Columbia University; Vice-Pres. For Outreach and Engagement of the International Science Council)
- Prof Mohamed Jeebhay (Head: Division of Occupational Medicine, School of Public Health Medicine, UCT)
- Prof Rajen Naidoo (Head: Discipline of Occupational and Environmental Health, School of Nursing and Public Health, UKZN)

The following speakers represented the key OHS stakeholder bodies who contributed their reflections on the two-year COVID-19 experience:

- Mr Norman Khoza (African Union Development Agency - New Partnership for Africa's Development / AUDA-NEPAD)
- Prof Daan Kocks (South African Society of Occupational Medicine / SASOM)
- Ms Denise Minnie (South African Society of Occupational Health Nursing Practitioners / SASOHN)
- Prof Cas Badenhorst (Southern African Institute for Occupational Hygiene / SAIOH)
- Ms Lisa Seftel (National Economic Development and Labour Council / NEDLAC)
- Mr Matthew Parks (Labour Representative; Congress of South African Trade Unions / COSATU)
- Dr Christy Braham (Women in Informal Employment: Globalizing and Organizing / WIEGO)

Professors Jeebhay and Naidoo addressed the webinar's key focus, the "*Recommendations for future epidemics and strengthening OH system resilience: What can be done?*" towards strengthening national resilience and workplace-level capacity for prevention and outbreak preparedness.

979 OHS stakeholders and professionals joined the webinar.

OHS Webinar: Occupational Medicine Section presentation (Friday, 27th May 2022)

The NIOH's Occupational Medicine Section presented to the National Union of Mineworkers (NUM) PWV Region gathering. Sr Goitsimang Buffel and Dr Hloniphile Maso conducted a session for the union's Regional Health & Safety Structure meeting (REHSCO) at Booyens Hotel in Johannesburg.

28 participants attended.

OHS Webinar: Occupational Hygiene Training Association (OHTA) Training (27 June-01 July 2022)

The Occupational Hygiene Section presented Occupational Hygiene Training Association (OHTA) training W201 module, titled: "Basic principles in Occupational Hygiene". This was presented as a hybrid learning, with two delegates from South Africa attending in-person, while eleven delegates from Tanzania, Zambia, DRC and Ivory Coast attended remotely via Zoom.

The course aimed to provide a foundation and practical understanding of occupational hygiene for students or persons involved with management of occupational health issues in the workplace. The course objectives included the following:

- The value of occupational hygiene and the role of the occupational hygienist
- The range of health hazards encountered in the workplace
- Hazard recognition techniques
- Sources and potential routes of occupational exposure
- Exposure assessment and the measurement processes involved
- Methods of controlling exposure
- The management of occupational hygiene programmes

13 attendees joined the webinar.

For more information on training courses and future training events, please contact us via email on E-learning@nioh.ac.za



YouTube



SUBSCRIBE



Follow us on YouTube

<https://www.youtube.com/channel/UCA24Q1QQmshRuX-pKzVWtWA/videos>



The NIOH will continue to provide training on COVID-19 and for further info check the website for training updates at <http://www.nioh.ac.za/covid-19-presentations/>. If there is any specific training that the readers feel is important and should be done they can send a request to info@nioh.ac.za.



Dr Wells Utembe was recently appointed an Honorary Senior Lecturer in the Division of Environmental Health, School of Public Health and Family Medicine, University of Cape Town. Dr Utembe also serves as a Research Associate in the Department of Environmental Health, University of Johannesburg. Dr Utembe holds a PhD in Public Health from the University of the Witwatersrand, a Master's degree in Environmental Sciences from University Putra Malaysia and a BSc (Honours) in Chemistry from the University of Malawi. He also obtained certificates in Toxicology and Risk assessment from the University of Pretoria and the University of the Witwatersrand.



Ms Lufuno Muleba graduated with a Masters in Technology from the University of Johannesburg on 11 May 2022. Her research focused on the "Assessment of anti-bacterial effectiveness of hand sanitisers commonly used in South Africa". Ms Muleba currently works as a Medical Scientist within the Immunology and Microbiology Section at NIOH.



Dr Mark Keyter from the NIOH Pathology Division was awarded the Dhiren Govender Medal for obtaining excellent results in the Part II Anatomical Pathology Fellowship examination at the recent Colleges of Medicine of South Africa graduation. The ceremony took place on 21 April 2022

AWARDS AND RECOGNITION

COVID-19

Ventilation & Vaccination Vital for workplace safety

In addition to the known non-pharmaceutical COVID-19 control measures, here are some other crucial precautions that can help.



Consider taking the vaccine. It provides an added layer of protection.



Natural and artificial ventilation is important. Always allow fresh outdoor air in indoor spaces.



Utilise outdoor spaces wherever possible.



Opt for online meetings. Avoid face to face contact if you can.



Don't listen to social media hype. Listen to medical experts.



Try to avoid crowds and limit gatherings.



COVID-19 Workplace Preparedness & Prevention
HEALTHY, SAFE & SUSTAINABLE WORKPLACES

Workplace Hotline: 0800 2121 75

Occupational Health Surveillance System [OHSS]

General queries for data submission: 0723215503 | 0713981169 | OHSWorkplace@nioh.ac.za

www.nioh.ac.za

info@nioh.ac.za

[twitter: @nioh_sa](https://twitter.com/nioh_sa)

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LABORATORY SERVICE

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Division of the National Health Laboratory Service



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