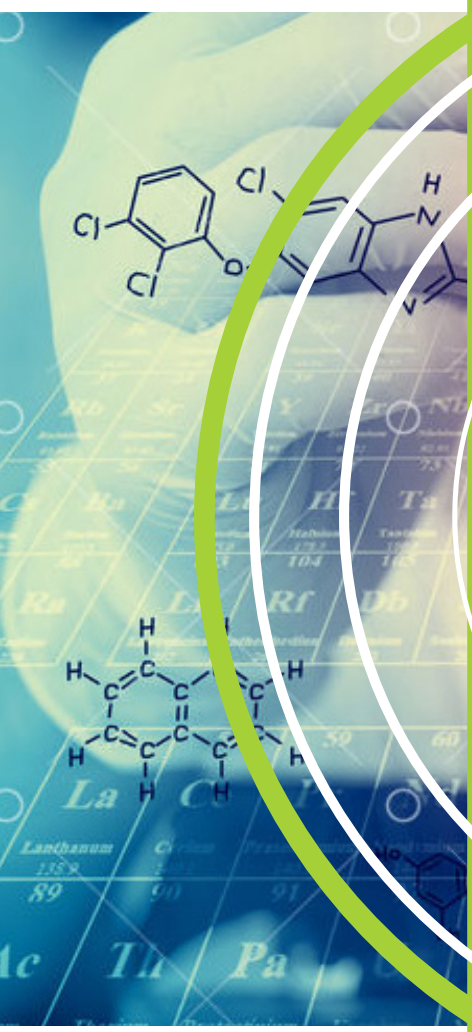
Volume 2
Issue 4

APRIL
2021

NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH

Division of the National Health Laboratory Service



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IN THIS ISSUE

MESSAGE FROM THE CHIEF EDITOR

The year 2020 brought so many health and safety challenges, many of which were overcome with a new set of rules and behavioral norms put in place at workplaces. As we move on to the 2nd year of COVID-19, last year's conditioning, which has enabled us to start doing things a little differently, be adaptable to change and accepting that this is what it is going to be like for the possible future, it is hoped that we can all embrace an "adopt and get on with it' approach to succeed in our efforts.

In our quest to keeping you up to date with the latest developments of the institute, we share with you the various activities and projects which, the NIOH has been working on in the past three months. In this last issue of volume two of Occuzone, we firstly highlight our research activities with a special focus on the knowledge, attitudes and practices of health workers in South Africa regarding the Infection Prevention and Control (IPC) of SARS-CoV-2 and showcase the scientific publications produced by our researchers during this period. We also profile one of our emerging researchers, a Medical Scientist at the NIOH's Pathology Division.

As part of surveillance of occupational exposures and health outcomes which is an essential function of the NIOH, this edition presents an update on the Health Care worker hospital admissions for COVID-19 related diseases. We further showcase two critical services offered by the institute, namely, the NIOH Occupational Medicine Specialist Clinic service as well as the HealthWise service offered by the HIV/TB in the Workplace Unit of the institute. Lastly, we showcase various training offered by the institute including COVID-19 themed training sessions conducted for various industries in both formal and informal economies.

I would like to thank the editorial team for their valuable time and expertise in producing this publication, and the authors for their valued contribution to this issue.

I wish you all refreshing and engaging times ahead.

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Editor in Chief
Angel Mzoneli

Research

Message from the Research Committee Chair

"The only constant in life is change" – Heraclitus. And with COVID-19 change appears to be the new normal as we adapt to survive. However, to make a meaningful change within our workspaces, we must be cogniscent of our environment and the potential hazards that may befall us. Research empowers us with new knowledge of these environments, exposures, and diseases, informing our decisions and actions. In this edition, we focus on the knowledge, attitudes and practices of health workers in South Africa regarding the infection prevention and control (IPC) of SARS-CoV-2. Health workers play a pivotal role in maintaining and strengthening health systems that are vital for any country's wellbeing. However, health workers often turn patient themselves due to poor infection prevention and control strategies and weak occupational health services.

It is acknowledged that attaining new information is only a small aspect of advancing change as much depends on changing attitudes and behaviours. Therefore, it is envisaged that through the KAPS study summarised below, management within health facilities can take the necessary action to improve identified shortcomings, thus leading to effective change. The researchers at the Institute have also focused on nanoparticles and its impact on human health. There has also been a significant focus on vulnerable workers in the informal economy and chemical exposures. I wish you an enjoyable read and trust that the summaries invoke your interest.

Dr Tanusha Singh

RESEARCH FOCUS

A Health Worker Knowledge, Attitudes and Practices Survey of SARS-CoV-2 Infection Prevention and Control in South Africa

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National Institute for Occupational Health, 25 Hospital Street, Johannesburg, 2000

Health workers are crucial to the successful implementation of infection prevention and control (IPC) strategies to limit the transmission of SARS-CoV-2 at healthcare facilities. The aim of our study was to determine SARS-CoV-2 IPC knowledge and attitudes of frontline health workers in four provinces of South Africa as well as explore some elements of health worker and health facility infection prevention and control practices. A cross-sectional study design was used. The study population comprised both clinical and non-clinical staff working in casualty departments, outpatient departments, and entrance points of health facilities. A structured self-administered questionnaire was developed using the World Health Organization guidance as the basis for the knowledge questions. A total of 286 health workers from 47 health facilities participated in the survey. The mean score on the ten knowledge items was 6.3 (SD = 1.6). Approximately two-thirds of participants (67.4%) answered six or more questions correctly while less than a quarter of participants (24.1%) scored eight or more. A knowledge score of 8 or more was significantly associated with occupational category (being either a medical doctor or nurse), age (< 40 years) and hospital level (tertiary level). Only half of participants (50.7%) felt adequately prepared to deal with patients with COVID-19, whilst only 55.6% of participants had received IPC training. Some participants indicated they did not have access to medical masks (11.8%) and gloves (9.9%) in their departments. The attitudes of participants reflected a willingness to engage in appropriate SARS-CoV-2 infection prevention and control practices as well as a commitment to be involved in COVID-19 patient care. Ensuring adequate IPC training for all staff and universal access to appropriate PPE were identified as key areas that needed to be addressed. Interim and final reports which identified key shortcomings that needed to be addressed were provided to the relevant provincial departments of health.

For the full text article search the following citation: SV Moodley, M Zungu, M Malotle, K Voyi, N Claassen, J Ramodike, N Thunzi, **N Mlangeni** 2021. A health worker knowledge, attitudes and practices survey of SARS-CoV-2 infection prevention and control in South Africa. BMC Infectious Diseases, 2021, 21:138. doi:10.1186/s12879-021-05812-6

PUBLICATIONS

Title: Dissolution of citrate-stabilized, polyethylene glycol-coated carboxyl and amine-functionalized gold nanoparticles in simulated biological fluids and environmental media

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

Source: *J Nanopart Res (2021) 23:29 https://doi.org/10.1007/s11051-020-05132-x*

Abstract: Dissolution is an important property utilized to elucidate both short- and long-term effects of nanoparticles for their potential to cause harm to humans and the environment. Nanoparticles may therefore be classified based on their (bio) durability between those that are amenable and those that are resistant to dissolution, biodegradation and/or disintegration. The dissolution kinetics of uncoated citrate-stabilized, polyethylene glycol–coated (PEGylated) gold nanoparticles functionalized with carboxyl and amine functional groups in simulated biological and environmental fluids at physiological and room temperature, respectively, were studied using the static dialysis protocol to predict their (bio) durability. Citrate-stabilized gold nanoparticles showed high degrees of resistance to dissolution in the simulated media unlike those which were coated with polyethylene glycol and functionalized with carboxyl and amine functional groups. Generally, the extent of AuNP dissolution in acidic media (phagolysosomal fluid and gastric fluid) was greater than that in neutral or alkaline media such as Gamble's fluid, blood plasma and intestinal fluids, freshwater and seawater. However, in all these experimental conditions, the particles did not completely dissolve. In the case of amine-functionalized AuNPs, the nanoparticles released a maximum of only 15% of their original concentration whereas carboxyl functionalized and citrate-stabilized gold nanoparticles released 9% and 8.5% of gold ions, respectively. The rate and degree of dissolution depended on the surface functionalization, pH, ionic strength of the simulated fluid and particle aggregation. Therefore, the results indicate that gold nanoparticles with low dissolution rates are expected to be (bio)durable in biological and environmental surroundings; thus, they might impose long-term effects on humans and the environment. In contrast, those with high dissolution rate are not (bio)durable and hence may cause short-term effects.

Keywords: Dissolution; (bio)durability; Gold nanoparticles; In vitro acellular; Dissolution kinetics; Health and environmental effects

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Title: Mercury Injection by an Adult Female

Author(s): BV Kgarebe, LE Mochaki, RC Ballantine, P. Poongavanum, AT Mawela

Source: *Int. J. Adv. Biomed., 4, No. 1, 1- 4 (2020)*

Abstract: A case of subcutaneous injection of elemental mercury (Hg) by an adult white female in Gauteng, South Africa is described. The patient had been injecting Hg directly into her breast tissue. The exact quantity of injected Hg and the time period of exposure was unknown. First line of therapy was the surgical removal of the Hg droplets from the breast tissue followed by chelation therapy with 400mg of D-penicillamine given six-hourly over a period of five days. Whole blood samples of the patient were received at the Analytical Services Laboratory of the National Institute for Occupational Health (NIOH) to monitor blood mercury (Bl-Hg) levels. Initial results showed an exponential decrease in Bl-Hg levels after commencement of treatment. By week 18, Hg levels had decreased to 24 µg/L. Further testing needed to be done, however the patient did not present for any future appointments.

Keywords: *Elemental mercury poisoning, subcutaneous injection, chelation therapy.*

Title: Lung retention and particokinetics of silver and gold nanoparticles in rats following subacute inhalation co-exposure

Author(s): JK Kim, HP Kim, JD Park, K. Ahn, WY Kim, **M. Gulumian** et al.

Source: *Particle and Fibre Toxicology (2021) 18:5* https://doi.org/10.1186/s12989-021-00397-z

Background: Inhalation exposure to nanomaterials in workplaces can include a mixture of multiple nanoparticles. Such ambient nanoparticles can be of high dissolution or low dissolution in vivo and we wished to determine whether co-exposure to particles with different dissolution rates affects their biokinetics.

Methods and Results: Rats were exposed to biosoluble silver nanoparticles (AgNPs, 10.86nm) and to biopersistent gold nanoparticles (AuNPs, 10.82nm) for 28days (6-h/day, 5-days/week for 4weeks) either with separate NP inhalation exposures or with combined co-exposure. The separate NPs mass concentrations estimated by the differential mobility analyzer system (DMAS) were determined to be 17.68±1.69μg/m3 for AuNP and 10.12±0.71μg/m3 for AgNP. In addition, mass concentrations analyzed by atomic absorption spectrometer (AAS) via filter sampling were for AuNP 19.34±2.55μg/m3 and AgNP 17.38±1.88μg/m3 for separate exposure and AuNP 8.20 ± 1.05μg/m3 and AgNP 8.99 ± 1.77μg/m3 for co-exposure. Lung retention and clearance were determined on day 1 (6-h) of exposure (E-1) and on postexposure days 1, 7, and 28 (PEO-1, PEO-7, and PEO-28, respectively). While the AgNP and AuNP deposition rates were determined to be similar due to the similarity of NP size of both aerosols, the retention half-times and clearance rates differed due to the difference in dissolution rates. Thus, when comparing the lung burdens following separate exposures, the AgNP retention was 10 times less than the AuNP retention at 6-h (E-1), and 69, 89, and 121 times lower less than the AuNP retention at PEO-1, PEO-7, and PEO-28, respectively. In the case of AuNP+AgNP co-exposure, the retained AgNP lung burden was 14 times less than the retained AuNP lung burden at E-1, and 26, 43, and 55 times less than the retained AuNP lung burden at PEO-1, PEO-7, and PEO-28, respectively. The retention of AuNP was not affected by the presence of AgNP, but AgNP retention was influenced in the presence of AuNP starting at 24h after the first day of post day of exposure. The clearance of AgNPs of the separate exposure showed 2 phases; fast (T1/2 3.1days) and slow (T1/2 48.5days), while the clearance of AuNPs only showed one phase (T1/2 .81.5days). For the co-exposure of AuNPs+AgNPs, the clearance of AgNPs also showed 2 phases; fast (T1/2 2.2days) and slow (T1/2 28.4days), while the clearance of AuNPs consistently showed one phase (T1/2 54.2days). The percentage of Ag lung burden in the fast and slow clearing lung compartment was different between separate and combined exposure. For the combined exposure, the slow and fast compartments were each 50% of the lung burden. For the single exposure, 1/3 of the lung burden was cleared by the fast rate and 2/3 of the lung burden by the slow rate.

Conclusions: The clearance of AgNPs follows a two- phase model of fast and slow dissolution rates while the clearance of AuNPs could be described by a one- phase model with a longer half-time. The co-exposure of AuNPs+AgNPs showed that the clearance of AgNPs was altered by the presence of AuNPs perhaps due to some interaction between AgNP and AuNP affecting dissolution and/or mechanical clearance of AgNP in vivo.

Keywords: Gold nanoparticles; Silver nanoparticles; Subacute inhalation exposure; Co-exposure; Particokinetics; Toxicokinetics; Lung retention

Title: Hypertension and associated risk factors among informal waste pickers in Johannesburg, South Africa

Author(s): V Ntlebi, F Made, K Wilson, T Kootbodien, N Tlotleng, N Naicker.
Source: *Occup Health Southern Afr. 2020; 26(6):282-286.*

Background: A growing number of individuals, commonly known as waste pickers, driven by poverty and unemployment, earn a living recovering recyclable material. A few studies have investigated the prevalence of hypertension in the South African general population but none has investigated hypertension in waste pickers. We aimed to estimate the proportion of hypertension and to identify associated risk factors among waste pickers in Johannesburg, South Africa.
Methods: In this cross-sectional study, convenience sampling was used to select waste pickers at two landfill sites in Johannesburg, in 2018. Health-screening assessments included measurements of weight, height and blood pressure. An electronic questionnaire was used to collect socio-demographic, health status and behavioural information. Descriptive statistics for continuous covariates, such as age, were summarised as means and standard deviations, while categorical variables were summarised as numbers and percentages. The two-sample test for proportions was conducted to assess the differences in proportions of hypertension. Logistic regression was used to test associations between hypertension and risk factors.
Results: Three hundred and sixty-one landfill waste pickers participated in the study. Of these, 265 (73.4%) were male and 96 (26.6%) were female. The proportion of women (42.7%; n = 41) with hypertension was higher than that of men (24.2%; n = 64). The adjusted analyses showed that age and injuries were statistically significantly associated with hypertension. For every one-year increase in age, the odds of developing hypertension increased by 5% (AOR = 1.05; 95% CI: 1.03–1.09). The AOR for hypertension in waste pickers with injuries was double that of waste pickers without injuries (AOR = 2.43; 1.20–4.97).
Conclusion: The proportion of landfill waste pickers with hypertension was higher among women than men. Age and injuries were associated with hypertension. The findings suggest the need for a combination of primary healthcare and occupational health services for these workers.

Title: Simultaneous analysis of acetone, methyl ethyl ketone (MEK), and methyl isobutyl ketone (MIBK) in urine by headspace gas chromatography-flame ionisation detection (HS GC-FID)

Author(s): B. Southon, G. Riley, P. Matatiele, B. Kgarebe
Source: *Results in Chemistry 2 (2020) 100084*

Abstract: Acetone, methyl ethyl ketone (MEK), and methyl isobutyl ketone (MIBK) are ketones most widely used in industry and whose analysis is often used for the determination of occupational exposure. Current literature represents expensive and timeous methods to detect these three ketones simultaneously. This research aims to present a simple, rapid, current, inexpensive, and validated method, for routine analysis and simultaneous detection of acetone, MEK, and MIBK in urine, using headspace gas chromatography with aflame ionization detector (HS GC-FID), with no prior sample treatment. A general "dilute and shoot" method was used and validated for the following: selectivity, linearity, accuracy and precision, matrix effects, reproducibility, repeatability, ruggedness, carryover, and uncertainty of measurement. The calibration standards showed linearity for all compounds in the working analytical range of 0.80 mg/L to 100 mg/L and correlation coefficient values of > 0.99. The method was selective and produced an LOD of 0.01 mg/L and LOQ of 0.03 mg/L. This method passed all method validation parameters. Each run was completed in less than five minutes. In conclusion, this method is fast, reliable, and requires no sample pre-treatment. The combined uncertainty of measurement was less than 15% for all three ketones and should be taken into consideration when reporting results. The method was therefore deemed fit for routine analysis for the simultaneous detection of acetone, MEK, and MIBK in urine.
Keywords: *Acetone; MEK; MIBK; Headspace Gas Chromatography; Method Validation; Occupational Exposure*

Title: Living conditions and respiratory health in Walmer Township and Wells Estate, Port Elizabeth, South Africa

Author(s): J. Teare, **N. Naicker,** C. Swanepoel, R. Street, A. Mathee.

Source: *S Afr Med J 2021;111(1):33-39. https://doi.org/10.7196/SAMJ.2021.v111i1.14655*

Background: Many impoverished communities in South Africa (SA) simultaneously face multiple preventable socio-environmental hazards associated with elevated burdens of ill health. One such hazard is failure to institute effective buffer zones between human settlements and point sources of pollution such as airports and industrial zones.

Objectives: To gather information on living conditions, housing quality and health status in two poor communities in the SA coastal industrial city of Port Elizabeth.

Methods: The study was undertaken in Walmer Township, situated in close proximity to Port Elizabeth International Airport, and Wells Estate, which borders two industrial sites. Approximately 120 households were randomly selected from each study site. Following written informed consent, information on the neighbourhood environment and housing conditions was collected through administration of a structured questionnaire.

Results: The two study sites were similar in respect of household language, income, education, high levels of debt servicing and high reliance on social grants. Relative to Walmer Township, higher levels of indoor dust and bad odours in the neighbourhood were reported in Wells Estate, as were higher rates of selected respiratory ill-health symptoms. Upper respiratory tract symptoms were significantly associated with reports of high levels of indoor dust, while lower respiratory tract symptoms were significantly associated with low income, overcrowding, and having a young child in the household.

Conclusions: The study highlights a scenario of a triple environmental hazard to health in the study communities: (i) poverty; (ii) poor quality housing; and (iii) lack of an effective buffer zone between the study communities and local point sources of pollution. Respiratory ill-health conditions were significantly associated with poverty, household composition and living conditions.

Title: Gut microbiota-mediated pesticide toxicity in humans: Methodological issues and challenges in risk assessment of pesticides

Author(s): **W. Utembe**, AW Kamng'ona

Source: *Chemosphere 271 (2021) 129817*

Abstract: Many in vivo and in vitro studies have shown that pesticides can disrupt the functioning of gut microbiota(GM), which can lead to many diseases in humans. While the tests developed by the Organization of Economic Cooperation and Development (OECD) are expected to capture most apical effects resulting from GM disruptions, exclusion of GM in the risk assessment might mischaracterize hazards or over-estimate/underestimate risks, especially when extrapolating results from one species to another species or population with a substantially different GM. On the other hand, direct assessment of GM-mediated effects may face challenges in identifying hazards, since not all GM perturbations will lead to human adverse effects. In this regard, reliable and validated biomarkers for common GM-mediated adverse effects may be very useful in the identification of GM-mediated pesticide toxicity. Nevertheless, proving causality of GM-mediated effects will need modifications of Bradford Hill criteria as well as Koch's postulates, which are more suitable for the "one-pathogen" paradigm. Furthermore, risk assessment of GM-mediated effects may require pesticide toxicokinetics along the gut, possibly through modeling, and the establishment of the involvement of GM in the mechanism of action (MOA) of the pesticide. Risk assessment of GM mediated effects also requires the standardization of experimental approaches as well as the establishment of microbial reference communities, since variations exist among GM in human population.

Keywords: *Pesticides, Gut microbiota, Dysbiosis, Toxicity, Risk assessment, Dose response*

Title: Vulnerable Workers and COVID-19: Insights from a Survey of Members of the International Commission for Occupational Health

Author(s): J.Tamin, O. Samuel, A. Suraya, ID Ebuenyi, **N. Naicker** and M. Rajput-Ray.
Source: *: Int. J. Environ. Res. Public Health 2021, 18, 346. https://doi.org/10.3390/ijerph18010346*

Abstract: The COVID-19 pandemic has negatively impacted on the health and well-being of populations directly through infection, as well as through serious societal and economic consequences such as unemployment and underemployment. The consequences could be even more severe for those more vulnerable to the disease, such as the elderly and those with underlying health conditions. Indeed, there is evidence that such vulnerable populations are disproportionately affected in terms of both, their health and the socioeconomic impact. The aim of our study was to determine whether occupational health (OH) professionals thought that the COVID-19 pandemic might further disadvantage any particular group(s) of vulnerable workers globally, and if so, which group(s). A cross-sectional study was carried out with a sample of OH professionals by means of an online questionnaire which was shared via email within the ICOH (International Commission for Occupational Health) community. Data was collected over a period of two weeks in May 2020 and 165 responses from 52 countries were received. In this paper, the responses relating to questions about vulnerable workers are reported and discussed. Globally, our responders felt that those in less secure jobs (precarious employment (79%) and informal work (69%)), or unemployed (63%), were the most at risk of further disadvantage from this pandemic. The majority felt that their governments could act to mitigate these effects. There were suggestions of short-term alleviation such as financial and social support, as well as calls for fundamental reviews of the underlying inequalities that leave populations so vulnerable to a crisis such as COVID-19.
Keywords: COVID-19 pandemic; disadvantaged populations; vulnerable populations; workers; social justice; social determination of health; poverty; public health practice

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Title: Prevalence of common mental disorders and associated factors among golf course workers in Johannesburg, South Africa

Author(s): **N Tlotleng**, K Wilson, T Kootbodien, F Made, V Ntlebi, N Naicker
Source: *Occupational Health Southern Africa; Vol 27 No 1, January/February 2021*

Background: Poor work environments can lead to poor mental health in workers. Golf course workers are prone to poor health outcomes, including common mental disorders (CMDs) due to work-related stress, poor working conditions, and low socio-economic status.
Objective: To assess the prevalence and factors associated with CMDs among golf course workers in Johannesburg, South Africa.
Methods: In this cross-sectional study, convenience sampling was used to select 375 participants (300 golf caddies and 75 non-caddies) from six golf courses in Johannesburg, South Africa. A sociodemographic questionnaire and the World Health Organization's (WHO's) Self-Reporting Questionnaire (SRQ-20) to assess self-reported CMDs were administered by trained field workers. Logistic regression was used to investigate the association of sociodemographic factors, comorbidities, substance use and work stress-related factors with CMDs.
Results: The prevalence of CMDs was 35.3% in golf caddies and 24.3% in non-caddies. The adjusted odds (aORs) for CMDs among caddies was twice that of non-caddies but the difference was not significant (aOR 2.14, 95% CI 0.89–5.27). The aORs for alcohol use (aOR 3.86; 95% CI: 2.19–6.81), intimidation at work (aOR 3.59; 95% CI 2.01–6.43) and existing comorbidities (aOR 2.06; 95% CI; 1.05–4.03) were higher in those with CMDs.
Conclusion: A high proportion of golf course workers had self-reported CMDs. This preliminary study suggests that lifestyle factors such as alcohol use, and health- and work-related factors, are associated with CMDs. Further studies are needed to support these findings and provide information to develop intervention strategies, if needed.
Keywords: *golf courses, caddies, SQR-20, work-related stress, mental wellness*

Title: A health worker knowledge, attitudes and practices survey of SARS-CoV-2 infection prevention and control in South Africa

Author(s): SV Moodley, **M. Zungu**, M. Malotle, K. Voyi, N. Claassen et al.

Source: *BMC Infectious Diseases (2021) 21:138*

Background: Health workers are crucial to the successful implementation of infection prevention and control strategies to limit the transmission of SARS-CoV-2 at healthcare facilities. The aim of our study was to determine SARS-CoV-2 infection prevention and control knowledge and attitudes of frontline health workers in four provinces of South Africa as well as explore some elements of health worker and health facility infection prevention and control practices.

Methods: A cross-sectional study design was utilised. The study population comprised both clinical and nonclinical staff working in casualty departments, outpatient departments, and entrance points of health facilities. A structured self-administered questionnaire was developed using the World Health Organization guidance as the basis for the knowledge questions. COVID-19 protocols were observed during data collection.

Results: A total of 286 health workers from 47 health facilities at different levels of care participated in the survey. The mean score on the 10 knowledge items was 6.3 (SD=1.6). Approximately two-thirds of participants (67.4%) answered six or more questions correctly while less than a quarter of all participants (24.1%) managed to score eight or more. A knowledge score of 8 or more was significantly associated with occupational category (being either a medical doctor or nurse), age (<40years) and level of hospital (tertiary level). Only half of participants (50.7%) felt adequately prepared to deal with patients with COVD-19 at the time of the survey. The health workers displaying attitudes that would put themselves or others at risk were in the minority. Only 55.6% of participants had received infection prevention and control training. Some participants indicated they did not have access to medical masks (11.8%) and gloves (9.9%) in their departments.

Conclusions: The attitudes of participants reflected a willingness to engage in appropriate SARS-CoV-2 infection prevention and control practices as well as a commitment to be involved in COVID-19 patient care. Ensuring adequate infection prevention and control training for all staff and universal access to appropriate PPE were identified as key areas that needed to be addressed. Interim and final reports which identified key shortcomings that needed to be addressed were provided to the relevant provincial departments of health.

Keywords: SARS-CoV-2, COVID-19, Health workers, Infection prevention, Knowledge, Attitudes, Perceptions, Practices

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Title: Exercise, CaMKII, and Type 2 Diabetes

Author(s): **JS Joseph,** K. Anand, ST Malindisa, AO Oladipo, OF Fagbohun

Source: *EXCLI Journal 2021;20:386-399*

Abstract: Individuals who exercise regularly are protected from type 2 diabetesand other metabolic syndromes, in part by enhanced gene transcription andinduction of many signaling pathways crucial in correcting impaired metabolicpathways associated with a sedentary lifestyle. Exercise activates Calmodulindependentprotein kinase (CaMK)II, resulting in increased mitochondrial oxidative capacity and glucose transport. CaMKII regulates many health beneficial cellular functions in individuals who exercise compared with those who do not exercise. The role of exercise in the regulation of carbohydrate, lipid metabolism, and insulin signaling pathways are explained at the onset. Followed by the role of exercise in the regulation of glucose transporter (GLUT)4 expression and mitochondrial biogenesis are explained. Next, the main functions of Calmodulin-dependent protein kinase and the mechanism to activate it are illustrated, finally, an overview of the role of CaMKII in regulating GLUT4 expression, mitochondrial biogenesis, and histone modification are discussed.

Keywords: Exercise, Type 2 diabetes, CaMKII, GLUT4, mitochondrial biogenesis, insulin resistance

Title: Health services use and health outcomes among informal economy workers compared with formal economy workers: A systemic review and meta-analysis

Author(s): N. Naicker, F. Pega, D. Rees, S. Kgalamono and T. Singh

Source: *Int. J. Environ. Res. Public Health 2021, 18, 3189. https://doi.org/10.3390/ijerph18063189*

Background: There are approximately two billion workers in the informal economy globally. Compared to workers in the formal economy, these workers are often marginalised with minimal or no benefits from occupational health and safety regulations, labour laws, social protection and/or health care. Thus, informal economy workers may have higher occupational health risks compared to their formal counterparts. Our objective was to systematically review and meta-analyse evidence on relative differences (or inequalities) in health services use and health outcomes among informal economy workers, compared with formal economy workers.

Methods: We searched PubMed and EMBASE in March 2020 for studies published in 1999–2020. The eligible population was informal economy workers. The comparator was formal economy workers. The eligible outcomes were general and occupational health services use, fatal and non-fatal occupational injuries, HIV, tuberculosis, musculoskeletal disorders, depression, noise-induced hearing loss and respiratory infections. Two authors independently screened records, extracted data, assessed risk of bias with RoB-SPEO, and assessed quality of evidence with GRADE. Inverse variance meta-analyses were conducted with random effects.

Results: Twelve studies with 1,637,297participantsfromsevencountriesinfourWHO regions (Africa, Americas, Eastern Mediterranean and Western Pacific) were included. Compared with formal economy workers, informal economy workers were found to be less likely to use any health services (odds ratio 0.89, 95% confidence interval 0.85–0.94, four studies, 195,667 participants, I2 89%, low quality of evidence) and more likely to have depression (odds ratio 5.02, 95% confidence interval 2.72–9.27, three studies, 26,260 participants, I2 87%, low quality of evidence). We are very uncertain about the other outcomes (very-low quality of evidence).

Conclusion: Informal economy workers may be less likely than formal economy workers to use any health services and more likely to have depression. The evidence is uncertain for relative differences in the other eligible outcomes. Further research is warranted to strengthen the current body of evidence and needed to improve population health and reduce health inequalities among workers.

Keywords: occupational health; health inequalities; informal economy; health services use; occupational injuries; depression

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Title: Role of CaMKII in the regulation of fatty acids and lipid metabolism

Author(s): JS Joseph, K. Anand, ST Malindisa, OF Fagbohun

Source: *Diabetes & Metabolic Syndrome: Clinical Research & Reviews 15 (2021) 589-594*

Background & aims: Previous studies have reported the beneficial roles of the activation of calmodulin-dependent protein kinase (CaMK)II to many cellular functions associated with human health. This review aims at discussing its activation by exercise as well as its roles in the regulation of unsaturated, saturated, omega 3 fatty acids, and lipid metabolism.

Methods: A wide literature search was conducted using online database such as 'PubMed', 'Google Scholar', 'Researcher', 'Scopus' and the website of World Health Organization (WHO) as well as Control Disease and Prevention (CDC). The criteria for the search were mainly lipid and fatty acid metabolism, diabetes, and metabolic syndrome (MetS). A total of ninety-seven articles were included in the review.

Results: Calmodulin-dependent protein kinase activation by exercise is helpful in controlling membrane lipids related with type 2 diabetes and obesity. CaMKII regulates many health beneficial cellular functions in individuals who exercise compared with those who do not exercise. Regulation of lipid metabolism and fatty acids are crucial in the improvement of metabolic syndrome.

Conclusions: Approaches that involve CaMKII could be a new avenue for designing novel and effective therapeutic modalities in the treatment or better management of metabolic diseases such as type 2 diabetes and obesity.

Keywords: CaMKII; Type 2 diabetes; Obesity; Metabolic syndrome; Lipid oxidation

Title: Risk factors for problematic alcohol use among male waste pickers and caddies in Johannesburg, South Africa: a cross-sectional study

Author(s): S. Mdleleni, N. Naicker, F. Made, V. Ntlebi, T. Kootbodien, N. Tlotleng, M. Makhubele, K. Wilson

Source: *Archives of Environmental & Occupational Health, DOI: 10.1080/19338244.2021.1879720*

Abstract: Informal workers may be prone to problematic substance use due to many factors, including adverse working conditions and low income. The aim of this secondary analysis was to investigate problematic alcohol use risk factors among male informal workers in Johannesburg, South Africa. Alcohol use among the two groups of informal workers in the analysis y golf caddies and waste pickers was measured using the World Health Organization (WHO) Alcohol Use Disorder Identification Test (AUDIT) tool. The WHO selfreporting questionnaire (SRQ) for common mental health disorders (CMD) was used to assess mental health. A multivariate logistic regression model was used to explore the predictors of problematic drinking in informal workers. The study consisted of 514 participants, of which 48.4% were golf caddies and 51.6%, waste pickers. Most participants were younger than 40years (50.9%). Over half of the participants (54.7%) were alcohol consumers and 74.1% were smokers. Over 60% of the participants who were alcohol consumers had a probable drinking problem. Unstratified regression results showed that common mental distress (aOR ¼ 1.06; 95%CI: 1.01–1.09), age: 30–40 years (aOR ¼ 2.17; 95%CI: 1.18–3.97), smoking (aOR ¼ 2.25; 95%CI: 1.34–3.79), and other water sources (aOR ¼ 0.2; 95%CI: 0.04–0.99) were associated with a probable alcohol problem. Waste pickers (aOR ¼ 0.33; 95%CI: 0.20–0.70) were less likely to be problematic drinkers compared to golf caddies. Problematic drinking in this study was common in both caddies and waste pickers along with smoking. Problematic alcohol use was associated with caddying, mental distress, age, and smoking. Measures such as providing counseling services to informal workers and improvement of working conditions may help change the behaviors of these vulnerable groups.

IN THE SPOTLIGHT

Zekhethelo Leticia Maseko, Medical Scientist Intern in the Pathology Division

Why did you choose this career and research path?
I have always been passionate about research and development to advance knowledge and give back to the medical field. This allows me to research and discover findings that were not initially there; to gain a better understanding of anatomical processes and diseases.

What training and qualifications did you undergo and where?
I did my Bachelor of Science (BSc) undergraduate degree and my BSc honours degree in medical science majoring in anatomy at the University of Kwazulu-Natal. I am currently doing my MSc in Medicine through dissertation in the field of anatomical science with the University of the Witwatersrand, and I'm currently doing my training in anatomical pathology to register as medical scientist with HPCSA.

What are the most enjoyable aspects of doing research?
Discovering new information, new findings and new scientific papers.

What are your research highlights to date?
My highlights are aligned to work we do in the anatomical department at NIOH, which is the lung pathology of miners occupationally and environmentally exposed to asbestos and other minerals. Discovering the different lung pathology exposure to asbestos causes, determining the association of exposure to asbestos fibers, asbestos bodies and asbestos-related diseases.

What are your career goals?
My current career goal is to become a medical scientist registered with HPCSA in anatomical pathology and to complete my master's degree in 2021 and register for my PhD in 2022. To continue doing more research that bring awareness and information.

Surveillance

Occupational 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. In this issue we present an update of Health Care worker admissions for COVID-19 related diseases.

HEALTH CARE WORKER COVID 19 HOSPITAL SURVEILLANCE (DATCOV) REPORT

The DATCOV hospital surveillance system aims to monitor trends in COVID-19 admissions and describe the epidemiology of COVID-19 in hospitalised patients in South Africa.

This surveillance system was initiated on the 1st April 2020 by the National Institute for Communicable Diseases. COVID-19 admissions data are submitted by public and private hospitals through DATCOV surveillance in all nine provinces of South Africa.

Methodology

Data on health care workers (HCW) have been extracted from the DATCOV database and reported weekly since 15 May 2020.

A COVID-19 case was defined as a person with a positive reverse transcriptase polymerase chain reaction (RT-PCR) assay for SARS-CoV-2 who was admitted to hospital. All hospitalized patients who were noted to be doctors, nurses, allied health care workers, laboratory staff, porters and administrative staff were captured as health care workers (HCWs). An individual was defined as having severe disease if treated in high care or intensive care unit (ICU) or ventilated or diagnosed with acute respiratory distress syndrome (ARDS).

As of 13 March 2021, a total of 643 facilities, 383 from public sector and 260 from private sector, submitted data on hospitalized patients with COVID-19.

Results

As of 13 March 2021, 6758 (3.1%) of the 216228 COVID-19 hospital admissions recorded on the DATCOV surveillance database, were health care workers (HCWs), reported from 643 facilities in all nine provinces of South Africa. Among 2194/6758 (32.5%) HCWs with available data on type of work, 1312 /2194 (59.8%) were nurses, 475/2194 (21.7%) porters or administrators, 189/2194 (8.6%) allied HCWs, 144 /2194 (6.7%) doctors, 52/2194 (2.4%) paramedics, and 22/2194 (1.0%) laboratory scientists.

There were 2293 (33.9%) and 4465 (66.1%) admissions reported in the public and private sector, respectively.

The majority of HCW admissions (5740/6758; 84.9%) were recorded in four provinces, with the highest number 2187/6758 (32.4%) reported in Gauteng, followed by 1769/6758 (26.2%) in KwaZulu-Natal, 978/6758 (14.5%) in Eastern Cape and 806/6758 (11.9%) in Western Cape provinces. (Figure 1). The median age of COVID-19 admissions among HCWs was 49 years (interquartile range [IQR] 39–57). There were 1238 (18.3%) admissions in HCW 60 years and older. Among admitted HCWs with COVID-19, 4739 (70.2%) were female. Among the 4739 female admissions, 120 (2.5%) were pregnant.

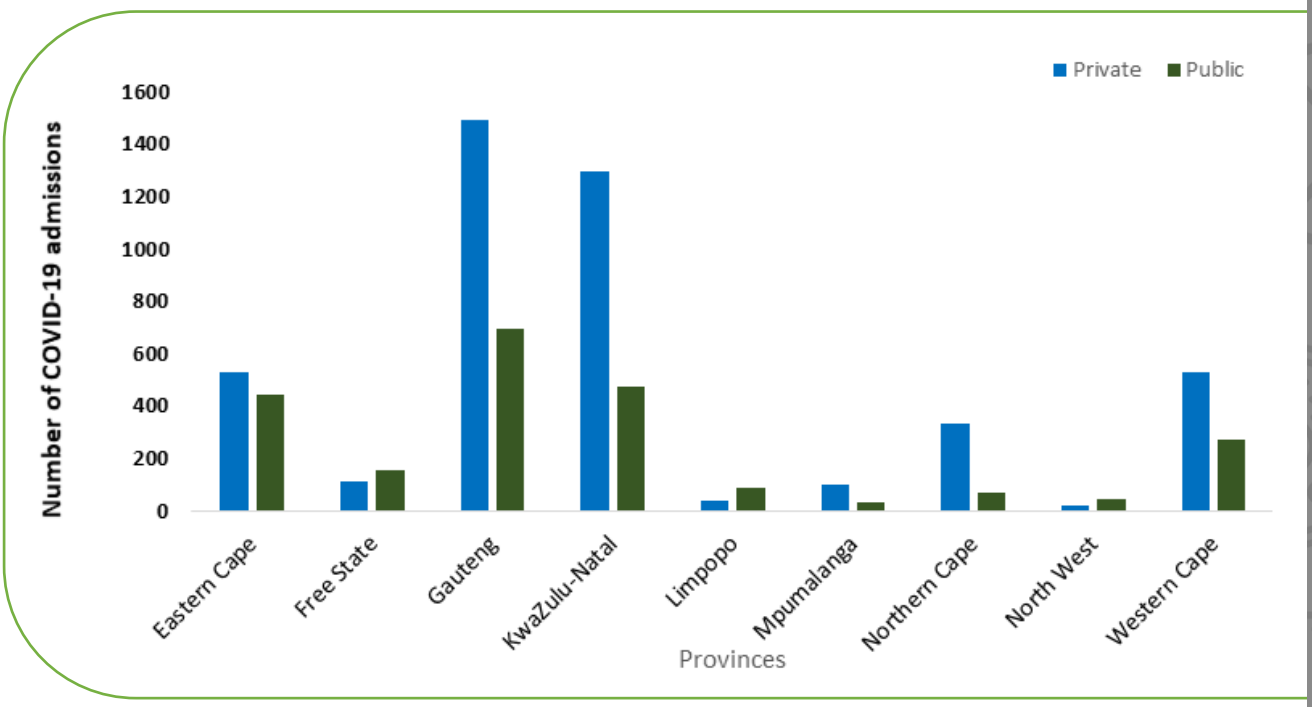


Figure 1: Number of reported COVID-19 admissions among HCWs by province and health-sector, South Africa, 5 March 2020 – 13 March 2021 (n=6758)

There were 3739 (55.3%) and 3019 (44.7%) HCW admissions in the first and second wave, respectively. During the first wave of the pandemic, HCW admissions peaked in week 28, and declined from week 29 to week 39 and remained steadily low, until it started increasing again in the second wave from week 44. The second peak occurred in week one of 2021. From the second week of 2021, the number of admissions declined dramatically. (Figure 2).

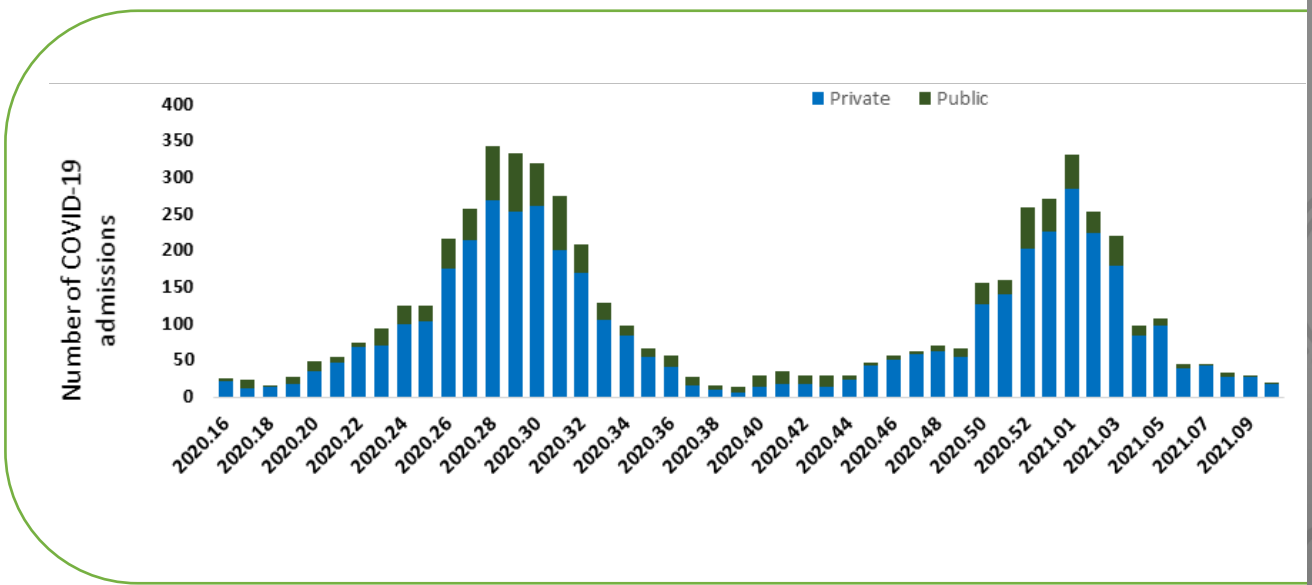


Figure 2: Number of reported COVID-19 admissions among HCWs by epidemiologic week of diagnosis and health-sector, South Africa, 5 March 2020 – 13 March 2021 (n=6758)

In Gauteng and KwaZulu Natal HCW admissions in the first wave peaked during weeks 28 -30 (Figure 3). Weekly admissions then declined and started increasing again at the beginning of the second wave, first in the Eastern Cape in week 46, followed by the Western Cape in week 48 then Kwa-Zulu Natal and Gauteng in week 49. Between week 1 and week 10 of 2021 HCW admissions declined across provinces. (Figure 3).

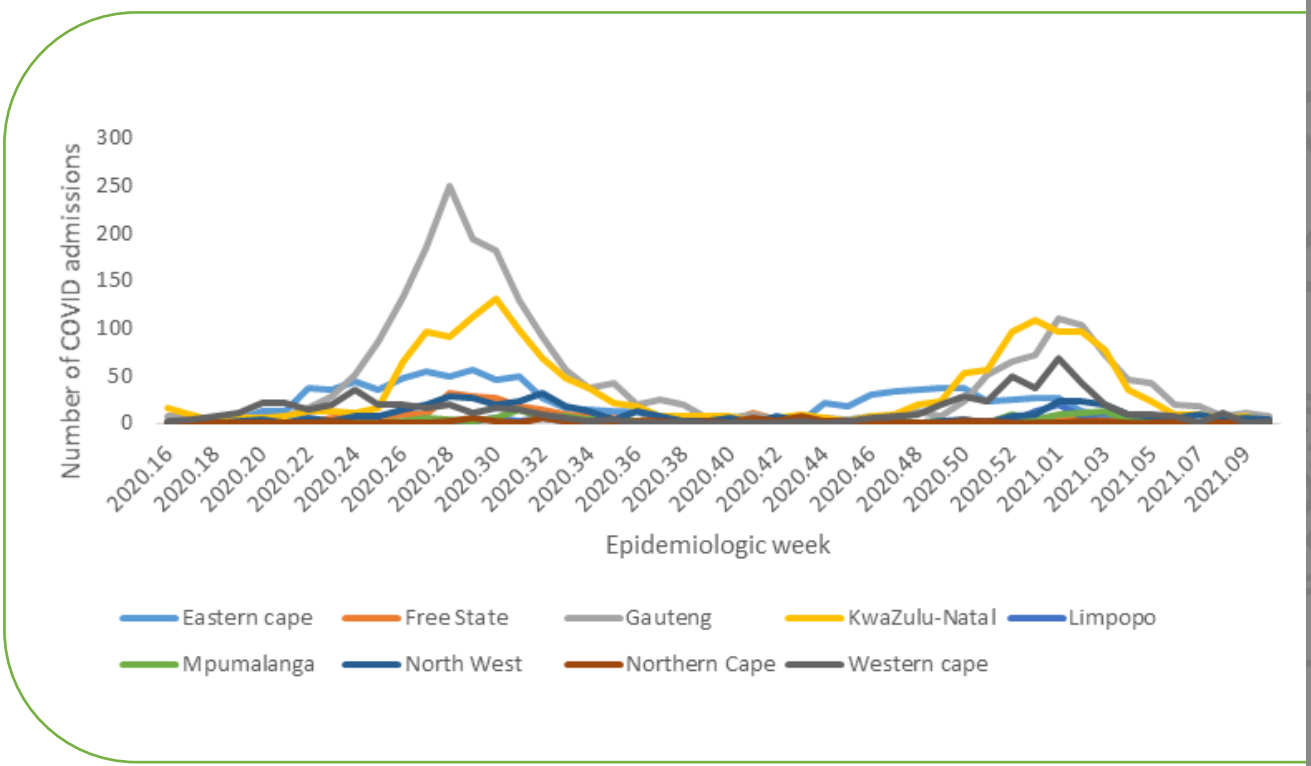


Figure 3: Number of reported COVID-19 admissions among HCWs by epidemiologic week of diagnosis and provinces, South Africa, 5 March 2020 –13 March 2021 (n=6758)

Comorbidities

The prevalence of comorbid diseases among HCW was 3046/5696 (53.5%). Among the 5696 HCWs who had reported a comorbid condition, the most commonly reported comorbid conditions were hypertension (1998/5696; 35.1%) and diabetes (1301/5696; 22.8%). There were 5.4% (310/5696) of HCWs that were HIV positive, 5.6% (320/5696) were obese, 0.8% (46/5696) had active tuberculosis (TB) and 0.9% (49/5696) reported a previous history of TB.

Outcome Severity

A total of 1114 (16.5%) HCW admissions were ever treated in ICU, of these 694 (62.3%) were treated with oxygen, 389 (34.9%) were treated on ventilation and 830 (74.5%) received both treatments. Of the 6758 HCW admissions, 5834 (86.3%) were discharged alive, 96 (1.4%) transferred out to either higher level care or step-down facilities, 753 (11.1%) HCWs had died (Figure 4) and 75 (1.1%) were currently in hospital. The majority of deaths among HCWs admitted with COVID-19, were reported in Kwa-Zulu Natal (211, 28.0%), followed by the Gauteng 193 (25.6%) and 172 (22.8%) from Eastern Cape provinces. Of the HCWs who died, 726 reported on comorbidities, 69.4% (504/726) had at least one comorbid disease reported and 37.2% (270/726) had more than one reported comorbidity. Among HCWs with known in-hospital outcome the case fatality ratio was 11.4% (753/6587). The CFR among non-HCW admissions was 23.7% (49016/207247).

A total of 423 (43.8%) HCWs died in the second wave compared to the 330 (56.2%) in the first wave. The proportion of deaths in the second wave was significantly higher than that of the first wave (p=0.0008). The CFR of HCWs was lower in the first wave (9.0%) than in the second wave (14.5%). CFR for Non-HCWs was 20.9% in the first wave, and 25.3% in the second wave.

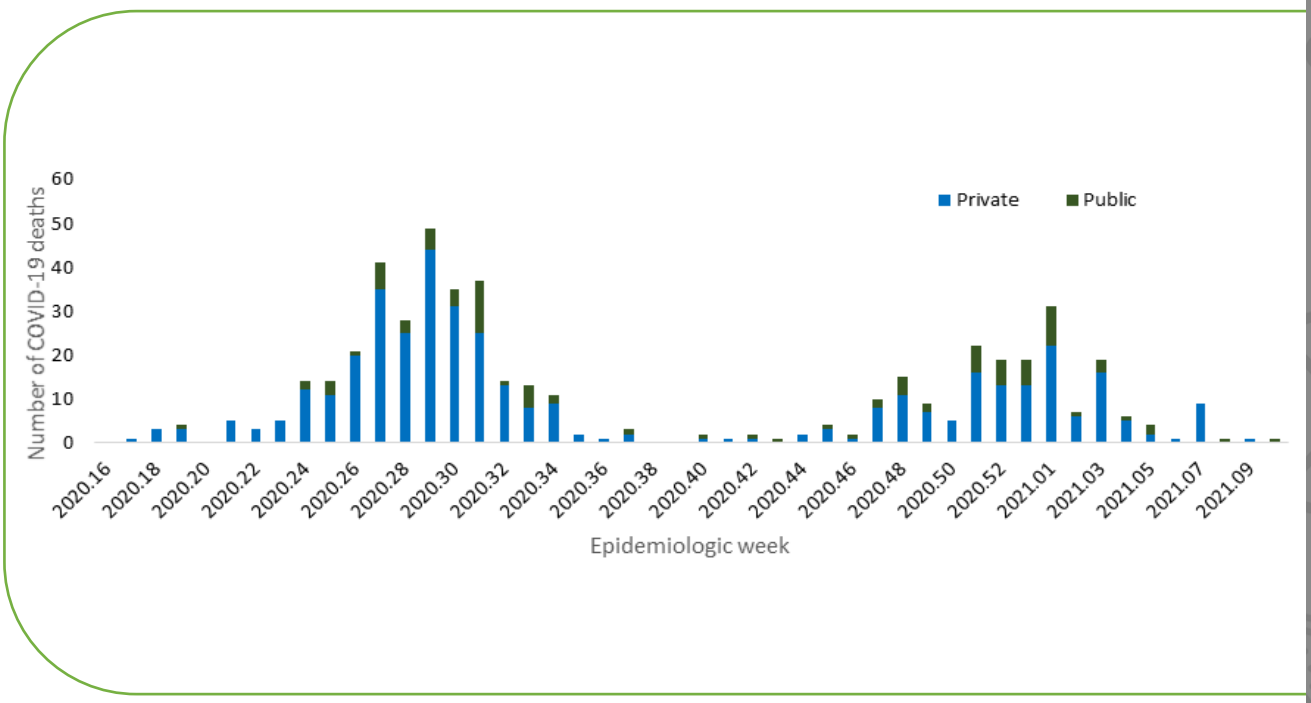


Figure 4: Number of reported COVID-19 deaths among admitted HCW by epidemiologic week in private and public sector, South Africa, 5 March – 13 March 2021.

CONCLUSION

The number of HCW admissions started increasing in the second wave of COVID-19 infections around week 45 of 2020 and declined from week 2 of 2021. By province, Gauteng, KwaZulu-Natal, Eastern Cape and the Western Cape had a higher number of HCW admissions from week 46-49. While the numbers of admissions were lower in the second wave, the number of deaths and the CFR of HCWs was higher in the second wave than in the first wave. A higher proportion of deaths was observed among healthcare workers with comorbid medical conditions than among those without comorbid conditions.

For comprehensive reports on HCW admissions – please see https://www.nioh.ac.za/covid-19-occupational-health-surveillance/

For more information on Occupational Health Surveillance at the NIOH please contact the Epidemiology and Surveillance Section at 011 712 6472 or info@nioh.ac.za

Specialized Service Delivery

Due to the pandemic, some of the specialised services within the NIOH were suspended following the announcement of lockdown regulations. In this issue, we announce the reopening of the NIOH Occupational Medicine Specialist clinic services, with employee referrals for clinical assessment now accepted. We also showcase a service on HealthWISE which resides within the HIV/TB in the Workplace Unit.

THE NATIONAL INSTITUTE OF OCCUPATIONAL HEALTH (NIOH) OCCUPATIONAL MEDICINE SPECIALIST CLINIC RE-OPENS

The NIOH Occupational Medicine Specialist (OMS) clinic has a long-standing history of providing occupational medicine clinical assessments for employees in a variety of industries to assist in the diagnosis, assessment and management of work-related medical conditions. The clinic operations were suspended from March 2020 following the declaration of the COVID-19 pandemic.

Following the easing of lockdown regulations under the South African Government Disaster Management Act, No 57 of 2002, the occupational medicine clinic was not in a position to conduct medical assessments physically, and the clinic provided largely advisory services virtually, telephonically and by email, to Occupational medicine and nurse practitioners in industries. This was due to multiple factors, including non-classification of the clinic as an essential service, limitations in access to essential support services, such as lung function testing, as well as COVID-19 protocols and workplace prevention measures. Lung function testing is a critical service that is required in managing most OMS clinic clients, however, services could not be rendered by the lung function laboratory following the South African Thoracic Society (SATS) position statement on respiratory procedures during the COVID-19 pandemic, issued on the 22 April 2020 and endorsed by the South African Society of Occupational Medicine (SASOM) on 24 April 2020.

During the non-patient facing operations of the OMS clinic, the clinic management worked on improving the clinic systems and updating standard operating procedures (SOP's). The clinic has been revamped with new equipment, a new patient booking system and enhanced human resource capacity with operational efficiency within the broader context of quality assurance. Some of the new procedures that will be implemented on re-opening include:

- An upfront payment is required before a consultation date is allocated, scheduled and secured.
- All referral and other required documents are to be submitted to the clinic electronically prior to booking a consultation.
- Only patients who have confirmed appointments will be assessed on the day allocated to them.

The clinic will be operating from Monday - Thursday (08h00-16h00), on a weekly basis based on the demand. The clinic will be strictly following the COVID-19 protocols as stated by the Disaster Management Regulation Act, No 57 of 2002, of the country including the universal infection control measures for clinical settings.

The clinic will also resume with the provision of ergonomic assessments and walkthrough services at the workplace following the patient consultation recommendations and requests from workplaces, with emphasis on COVID-19 compliance regulations.Industries are encouraged to make appointment bookings in advance, as the consultation fee needs to be paid up upfront. The consultation fee tariffs will be communicated in due course.

For more information regarding this service contact:
Occupational Medical Clinic
Dr Nompumelelo Ndaba
NompumeleloN@nioh.ac.za | 011 712 6430

For bookings please contact:
Mr Jacob Senamolela
JacobSe@nioh.ac.za | 011 712 6462

HEALTHWISE – WORK IMPROVEMENT IN HEALTH SERVICES

Health workers (HWs), in short supply in South Africa as well as many other low-and-middle income countries are at increased risk of SARS-CoV-2 infection during the course of their employment. It is therefore imperative that quick and efficient measures be taken to protect HWs.

The National Institute for Occupational Health (NIOH) in collaboration with Provincial Departments of Health (PDoH) and the University of Pretoria supports health facilities in implementing the ILO/WHO developed HealthWISE tool.

The HealthWISE tool aims to teach HWs who are not formally trained in occupational health and safety (OHS), particularly health risk assessment (HRA) on how to conduct their own HRA in the area in which they work.

In the COVID-19 health facility preparedness, the NIOH has been working with the Gauteng, Limpopo, Mpumalanga, and North West PDoH on the implementation of HealthWISE tool to improve OHS and Infection Prevention and Control.

For more information regarding this service contact:
Mr Jonathan Ramodike
JonathanR@nioh.ac.za | 011 712 6623

Prof Muzimkhulu Zungu
muzimkhuluz@nioh.ac.za | 011 712 6623

Dr Nkululeko Thunzi
NkululekoT@nioh.ac.za | 011 712 6538

Teaching & Training

The NIOH has continued to carry out numerous COVID-19 and discipline specific training sessions for various industries and related professions in both the formal and informal sectors over the past quarter. These training sessions were developed in modules based on topics and specific to sectors and the needs of the NIOH stakeholders.

In terms of continuous professional development (CPD) accreditation, the following professional bodies have approved our training sessions for COVID19:

- **HPCSA medical and dental board approved**
- **SADA approved**
- **SAIOH approved**
- **SAIOSH approved**
- **StellMed/SANC approved (Occupational Nurse Practitioners)**

TRAINING CONDUCTED

NHLS Staff Info session – COVID-19 Update

The NIOH Training supported the first COVID-19 Update webinar NHLS Staff On Wednesday 27th January 2021, training was conducted for NHLS staff that provided an update on COVID-19. The programme covered the latest developments around the COVID-19 new variant; testing types and immunity; clinical warning signs and quick pointers to home care when infected; and an emphasis on the importance of workplace COVID-1 precautions. 417 internal NHLS staff members attended the 1-hour webinar. The external presenters included Dr Jinal Bhiman, Dr M. Hsiao, and Prof Lucille Blumberg. The NIOH presenters were Dr Graham Chin, Ms Michelle Morgan and Mr David Jones.

Occupational Health Surveillance of COVID-19 in South African Workplaces

The NIOH partnered with the Council for Scientific and Industrial Research (CSIR) and National Institute for Communicable Disease (NICD) to deliver the 1.5-hour webinar on Occupational Health Surveillance (OHS) of COVID-19 in South African Workplaces delivered on Thursday 11th February 2021. Prof Nisha Naicker led the team and provided the overview of the Occupational Health Surveillance System (OHSS) and data submission guidelines. The programme further covered the process after data submission by South African employers; how to submit using NEXTCLOUD, API, and CMORE mechanisms; and the dashboard overview. The Q&A session included the contributions of the presenters Dr Jabu Mtsweni (CSIR), Mr Fazil Mckenna (NICD), Mr Monty Rambau (NIOH), and Mr Herman Le Roux (CSIR). A total of 1'329 participants attended this webinar.

Watch it here (icon of binoculars): https://youtu.be/iJl7T1rCz4w

Watch it here: *https://youtu.be/iJl7T1rCz4w*

Covid-19 Health Risk Assessment Training

The NIOH delivered the Covid-19 Risk Assessment Training on Wednesday 24th February 2021. The target audience included the staff of the Office of Health Standards Compliance, the Department of Social Development (Free State), the Department of Traditional Affairs, the National School of Government, the officials of the South African Judiciary (via the Office of the Chief Justice) and other NIOH stakeholders. The programme covered the introduction to COVID-19 preparedness and prevention in the workplace; principles of health risk assessment; and the risk assessment tool. The presenters included Dr Graham Chin (Occupational Medicine Practitioner, NIOH/NHLS), Gabriel Mizan (Occ. Hygiene Section, NIOH), and Dikeledi Matuka (Immunology & Microbiology Section, NIOH). 1'275 webinar attendees attended the 2-hour webinar.

Watch it here: *https://youtu.be/JQTiRzk38DA*

Occupational Health Surveillance System (OHSS) CMORE tool – Creating your own reports, a hands-on workshop

The NIOH convened this practical "hands-on" workshop on 2 March 2021, organised by Prof Nisha Naicker, to transfer skills required by employers to effectively use the CMORE tools to create useful reports. This webinar followed-on the 11th February webinar on OHSS as part of the NIOH and CSIR collaborative project. The CSIR's Herman le Roux facilitated the topics and practical steps that included capturing events, use of the map view, event view filter, basic reporting, using analytics and detailed reporting, and exporting data through CMORE Analytics and Query View. The 151 attendees represented their employers who are legally required to submit the workplace related COVID-19 data to the OHSS which the NIOH is mandated to run.

Watch it here: *https://youtu.be/RjPB-VpkALM*

COVID-19 Vaccines in the Workplace – An Overview

This very popular COVID-19 vaccine webinar was opened by Dr Tanusha Singh, the chairperson of the NIOH's COVID-19 Outbreak Response Team (OHORT). The webinar, which took place on 4 March 2021, drew on the expertise and experience of the Sisonke Open Trail, the Gauteng Department of Health, the Steve Biko Academic Hospital, and the NHLS' Head of Immunology at Charlotte Maxeke Johannesburg Academic Hospital. The webinar focussed on the COVID-19 vaccine science; workplace programme consideration; an occupational health perspective; an Occupational Medicine Practitioners perspective on a clinical trial in vaccination; and a wide-ranging focus on the most critical questions raised by health workers and other workers. The presenters were Dr Simba Takuva and Dr Azwi Takalani (Sisonke Open Trail); Dr Sipho Senabe (GDoH); Dr Lumka Puwani (Steve Biko); and Prof Elizabeth Mayne (NHLS, Charlotte Maxeke). 1'244 attendees joined this popular online session.

Watch it here: *https://youtu.be/V4C3PjrMF5A*

General OHS and COVID-19 Training for H&S/SHE Reps

The Safety Health and Environment Department of the NIOH/NHLS led this webinar for the Health and Safety Representatives constituency in the South African workplaces. The OHS/COVID-19 webinar, convened on 9th March 2021. The programme focussed on the overview of applicable legislation; roles and responsibilities of H&S reps and H&S committees; risk assessment and incident investigation; and waste management. The NIOH/NHLS presenters included Dr Graham Chin (Occupational Medicine Practitioner), Ms. Michelle Morgan (Deputy Manager; National SHE Department), Mr David Jones (Manager; National SHE Department); and Ms Mmashela Kgole (Manager: Waste Assurance, National SHE Department). More than 297 attendees joined the webinar.

Watch it here: *https://youtu.be/BvBCU5gJrEo*

Covid-19 and Travel Medicine

The Occupational Medicine Section of the NIOH organised this webinar on COVID-19 and Travel Medicine convened on Thursday 18th March 2021. Dr Nompumelelo Ndaba (NIOH Occupational Medicine Specialists) opened the webinar. The presentations provided detailed background on work-related travel during the COVID-19 epidemic and global pandemic; the aviation industry preparedness; travel and tourism protocols; and travelling through "ports-of-entry". The presenters included Dr Albie Frey (Travel Doctor), Dr Lesego Bogatsu (SA Aviation Authority), Mt Thifhiwa Tshivhengwa (TBCSA), and Ms Pam Masilela (Port Health Services, NDoH). 602 participants attended the training session.

Watch it here: *https://youtu.be/WQTUl2pjDas*

COVID-19 Vaccines in the Workplace – An Overview (repeat session)

This COVID-19 vaccine webinar was repeated due popular demand from NIOH stakeholders. The webinar was opened by Dr Tanusha Singh, the chairperson of the NIOH's COVID-19 Outbreak Response Team (OHORT). This repeat webinar, which took place on 25 March 2021, provided an overview and update on the COVID-19 vaccine science; workplace programme consideration; an occupational health perspective; an Occupational Medicine Practitioners perspective on a clinical trial in vaccination; and a wide-ranging focus on the most critical questions raised by health workers and other workers. The presenters were Dr Simba Takuva and Dr Azwi Takalani (Sisonke Open Trail); Dr Sipho Senabe (Gauteng Dept. of Health); Dr Lumka Puwani (Steve Biko Academic Hospital); and Prof Elizabeth Mayne (NHLS Immunology, Charlotte Maxeke Johannesburg Academic Hospital). 781 attendees joined this popular online session.

Watch it here: *https://youtu.be/ly8L6eXqW6o*

Occupational Hygiene Report Writing and Interpretation

The NIOH Occupational Hygiene Section developed and provided an online training course on Occupational Hygiene Report Writing and Interpretation. This training was conducted over a period of 5 days - 15 – 19 March 2021 and was well attended by 20 participants mainly from the Department of Employment and Labour. The objectives of this training included: providing an overview of the purpose and legal requirements of report writing, exploring technical writing skills, and understanding the typical layout and content of occupational hygiene reports.

xCELLigence Real-Time Cell Analysis (RTCA)

The Toxicology and Biochemistry Section conducted a workshop on the xCELLigence RTCA system for Masters and Ph.D. students in the Department of Life and Consumer Sciences, University of South Africa (UNISA). The workshop took place from 15-17 March 2021 at Florida Campus in Johannesburg and consisted of theoretical as well as practical components. The workshop focused on lecturers that included; Cell Culture, xCELLigence assay principles and its research applications; setting up experiments, seeding cells, the addition of drug; xCELLigence data interpretation and analysis; statistical analysis of results using GraphPad Prism 5 software. The xCELLigence system is a new technological approach that allows the real-time cell analysis of adherent tumor cells that is beneficial in the field of cancer research (drug discovery).

COVID-19: What are the responsibilities of employers?

This repeat webinar, which took place on 15 April 2021, explored topics related to the legislated roles and responsibilities of employers in terms of health and safety responsibilities during COVID-19. Other topics that were covered included: what employers need to implement in response to COVID-19 and also looked at the employers COVID-19 containment in practice. The session closed with a Q&A and was attended by 610 delegates from various sectors of the economy.

Watch it here: *https://youtu.be/BhI5RXeNG4E*

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 arequest to info@nioh.ac.za.

UPCOMING EVENTS

THE BELOW TRAINING IS SCHEDULED AND PLANNED FOR THE DATES AS LISTED. PLEASE NOTE, HOWEVER, THAT THESE DATES ARE SUBJECT TO CHANGE. WE WILL KEEP STAKEHOLDERS UP TODATE WITH THE LATEST TRAINING WEBINARS BEING HELD.

DoEL's Virtual Launch of (new) Regulations for Hazardous Chemical Agents
Date: 20 April | Time 10h00-14h00

COVID-19: Long COVID and the workplace
Date: 22 April 2021 | Time: 10h30- 12h30

COVID-19: Workplace Risk Assessment, Cleaning, Decontamination, Storage and Transportation
Date: 29 April 2021 | Time: 10h30-12h30

Mental Health Resilience for Health Care Workers
Date: 4 May | Time: 10h30-12h30

Occupational Health & Safety, Workplace Systems and COVID-19
Date: 06 May | Time: 10h30-12h30

Workers' rights in the era of COVID-19 and the workplace
Date: 11 May | Time: 10h30-12h30

Standardization of Spirometry update 2019: Lung function interpretation workshop for occupational medicine practitioners
Date: 20 May | 13h00-16h00

COVID-19 RELATED INFORMATION & EDUCATION MATERIALS

The National Institute of Occupational Health (NIOH) and its Outbreak Response Task Team has been actively involved in COVID-19 training sessions and public dissemination of information and educational material since early March, when news of the first Coronavirus case was announced.

The NIOH has been utilising several platforms to reach South Africans including Twitter, YouTube and its website (**which has been zero-rated***) to raise awareness on its training sessions, educational videos and audio, as well as presentations and posters.

***The NIOH website is zero-rated by Vodacom, Telkom, MTN, Rain, MWeb & Internet Solutions. No data charges will therefore apply for users of these mobile network providers. All content and resources on this website can be downloaded and browsed for free, excluding YouTube viewing and downloading.**

This has so far been a resounding success and as Occupational Health and safety champions and ambassadors, we should all be utilising these training sessions and minute-long videos for our own health and safety and that of our colleagues, families and friends.

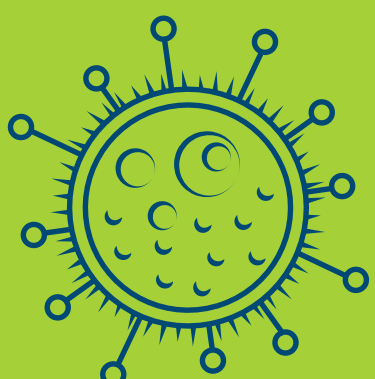
PLEASE SEE BELOW LINKS TO THE TWITTER VIDEOS ONLINE THUS FAR:

1. **COVID-19: What employers need to consider for vulnerable workers**
   https://twitter.com/i/status/1291267764536082432
2. **Steps employers can take when a worker is symptomatic or tests positive for Covid-19 at work**
   https://twitter.com/i/status/1284069083156287489
3. **The importance of Medical Screening**
   https://twitter.com/i/status/1300463361826721792
4. **The steps you need to know when donning gloves**
   https://twitter.com/nioh_sa/status/1270640765467754497
5. **Doffing of gloves is crucial in safeguarding yourself and these are some simple steps you can follow**
   https://twitter.com/i/status/1272567041736626176
6. **What employers need to know about risk assessment**
   https://twitter.com/nioh_sa/status/1267350168006877185
7. **This is how to doff gloves correctly using the Beak method**
   https://twitter.com/i/status/1276140184753627138
8. **Who should be wearing medical N95 respirators during the Covid-19 pandemic**
   https://twitter.com/nioh_sa/status/1253266050264809472
9. **What you need to know about surgical masks to promote health and safety in the workplace**
   https://twitter.com/nioh_sa/status/1263741273359421440
10. **As employers welcome staff back at work, follow these simple guidelines to ensure health and safety in the workplace**
    http://www.nioh.ac.za/covid-19
11. **Are you working during lockdown? This is how you can stay safe**
    https://twitter.com/nioh_sa/status/1247774605990752256

BELOW IS A LINK TO POSTERS AS WELL AS VARIOUS FACTSHEETS THAT HAVE BEEN DEVELOPED. THESE CAN BE UTILISED IN YOUR RESPECTIVE WORKPLACES AND ARE PRINT-READY (A3 SIZE).
NIOH Factsheets & Posters http://www.nioh.ac.za/covid-19/

PLEASE SEE BELOW LINKS TO MORE USEFUL TRAINING MATERIAL AND INFORMATION RESOURCES:

- **NIOH Training (Audio and Presentations)**
  http://www.nioh.ac.za/covid-19-presentations/
- **NIOH Training (Video recordings of the webinar)**
  https://www.nioh.ac.za/covid-19-presentations/video-training/
- **NIOH Training per presenter videos (compressed for mobile use)**
  http://www.nioh.ac.za/covid-19/covid-19-training-per presenter/
- **COVID-19 National Resources: Directives and guidelines**
  https://www.nioh.ac.za/home/national-resources-directives-guidelines/
- **Ethics Guidance for Occupational Health Practice**
  https://www.nioh.ac.za/covid-19-presentations/ethics-in-occupational-health-safety/
- **OHSS Business Portal - COVID-19 Workplace Surveillance**
  https://www.nioh.ac.za/covid-19/occupational-health-surveillance-system-ohss-business-portal/
- **Occupational Health Surveillance**
  https://www.nioh.ac.za/covid-19-occupational-health-surveillance/
- **Educational Video Resources**
  https://www.nioh.ac.za/educational-video-resources/
- **COVID-19 Frequently Asked Questions**
  https://www.nioh.ac.za/covid-19-faqs/



Awards & Recognition

RECOGNITION

- In March 2021 the Southern African Society for Occupational Hygienists (SAIOH) granted the NIOH Occupational Hygiene Section approval in its application to be a Recognised Training Provider (RTP) for the Asbestos AP101 module. This training course covers Asbestos Fibre Counting using Phase Contrast Microscopy (PCM) and this recognition by SAIOH is an official endorsement in terms of the quality and high standard this training course offers. Any SAIOH member that attends this course will be entitled to claim CPD points upon successful completion. As SAIOH is affiliated to IOHA (International Occupational Hygiene Association) and has close ties with BOHS (British occupational Hygiene Society), this course is also receiving international recognition.

- The Quality Council for Trades and Occupations (QCTO) has accredited the NIOH to offer the following COVID-19 related skills programmers for a period of 5 years beginning 17 March 2021, in accordance with the Skills Development Act and the Continuing Education and Training Act.

  - ► Workplace Preparedness and Risk Control Assistant: Communicable and other Occupational Diseases | NQF Level 3 | Credits 3
  - ► Workplace Preparedness and Risk Control Officer: Communicable and other Occupational Diseases | NQF Level 4 | Credits 5

The formal QCTO accreditation provides the NIOH the basis to apply its Occupational Health and general Occupational Health and Safety (OHS) capacity and skills base to reach the South African formal and informal sector workplaces through these registered/approved skills programmes. This strengthens the NIOH's ability to align its existing knowledge base and training materials to further its mandate to address strategic OHS training needs and capacity-building interventions through the registered/approved skills programmes. Subject to resource-allocation, the national focus on occupational diseases will be sharper and should have direct implications for meaningful interventions to promote healthy, safe and sustainable workplaces.

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

Promoting healthy, safe and sustainable workplaces

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