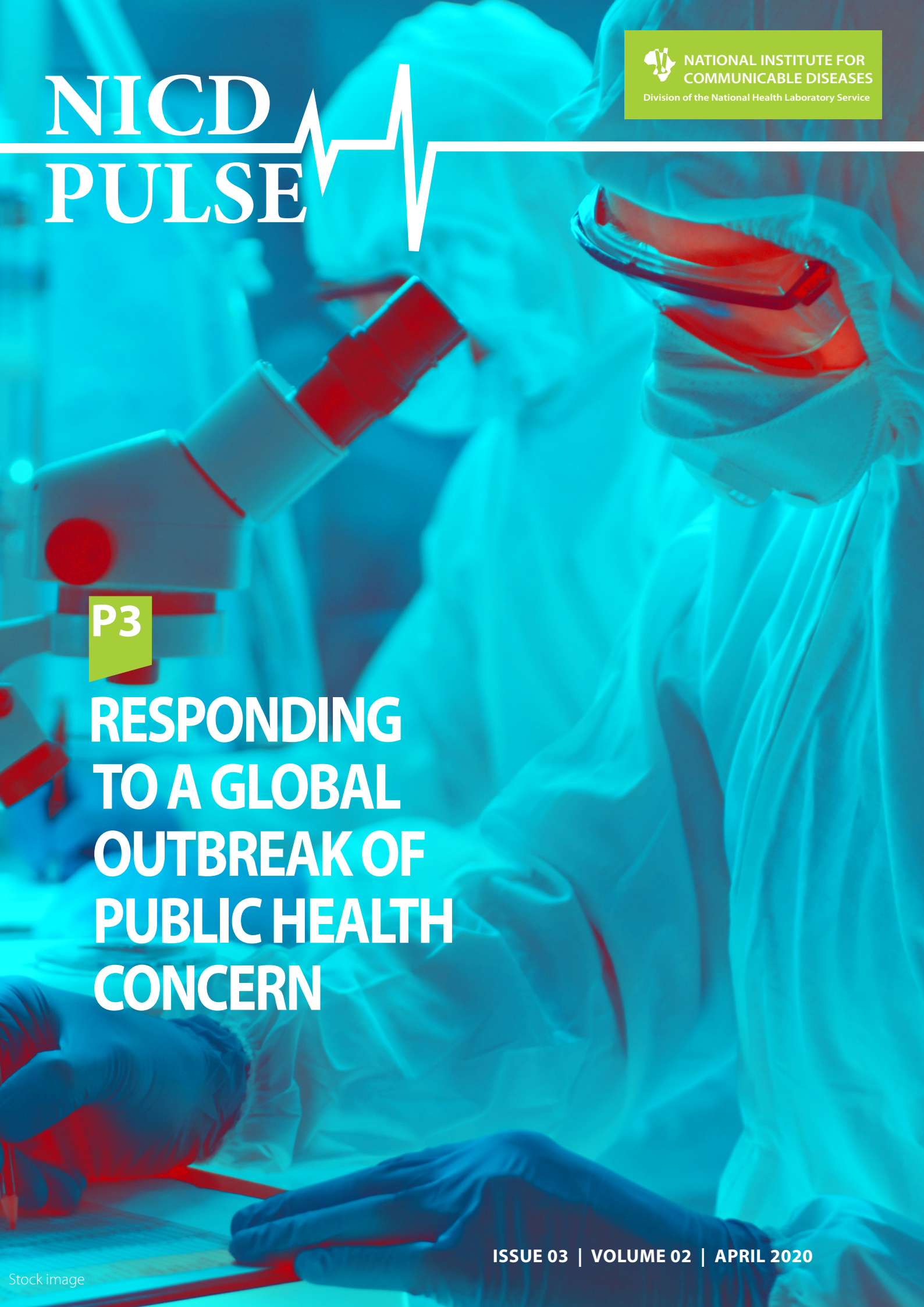

NICD PULSE

NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES
Division of the National Health Laboratory Service

P3

RESPONDING TO A GLOBAL OUTBREAK OF PUBLIC HEALTH CONCERN

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MESSAGE FROM THE INTERIM EXECUTIVE DIRECTOR

The NICD has undergone dramatic changes in the last few months following the arrival of coronavirus disease 2019 (COVID-19) in South Africa. Preparations for the outbreak started early which set our country on a good path that has been applauded by the World Health Organization. The team at the Centre for Respiratory Diseases and Meningitis (CRDM) began working on an in-house polymerase chain reaction assay as early as mid-January 2020 that allowed us to detect the first South African case of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on 5 March 2020. These efforts paved the way for the roll-out of mass testing through the National Health Laboratory Service (NHLS) with CRDM reverting to functioning as a reference laboratory for the country, providing specialist and technical support.

The Emergency Operations Centre (EOC) housed in the PRF Building was activated on 29 January 2020 by the Minister of Health who has been a regular visitor to our campus during this time. Teams of epidemiologists were deployed from the EOC to assist with contact tracing of the first cases and continue to support outbreak investigations in all provinces. A number of NICD staff are part of the Incident Management Team (IMT) that co-ordinates the outbreak response for the National Department of Health (NDoH). They are responsible for compiling the daily numbers and contribute to the analysis of the unfolding epidemiology. The NICD has been a reliable source of information during this outbreak through the provision of training, updated guidelines, active media engagement and sound technical advice to the NDoH.

The number of staff involved in the outbreak continues to grow in order to deal with the increasing number of cases and manage the complex operations. While some staff were newly recruited, many were drawn from other Centres at the NICD. It has been particularly pleasing for me to see the level of commitment of NICD staff and students to assist where necessary in a time of crisis. For those not directly involved in the outbreak, other important work has continued from home and many of us are now proficient in Zoom!

Monday, 4 May 2020, sees many of us returning to work but it will not be business as usual. The outbreak is far from over and we will need to continue practising prevention measures including social distancing and wearing of masks. Please take note of the new guidelines released by the NHLS on 28 April 2020 regarding screening and testing at work. There is also a self-assessment guideline to make sure that we do not contribute to the spread of COVID-19 on our campus. The NICD still has a very important role to play in this outbreak as we start public health surveillance to inform the next steps and try to understand the virology and immunology of this virus.

I want to warmly thank all staff involved in the COVID-19 outbreak response. This includes staff in the EOC and the Centres but also importantly the administrative and support staff of the NICD and the NHLS. All staff can be extremely proud of the role the NICD has played in this outbreak. Please continue to stay safe.

RESPONDING TO A GLOBAL OUTBREAK: A COLLECTIVE APPROACH

Image sourced from the European Pressphoto Agency

The COVID-19 – a global pandemic that has caused destruction and continues to threaten the world's population with well over one million infections worldwide – is a public health problem facing our generation today.

On 30 January 2020, the WHO declared the COVID-19 outbreak a Public Health Emergency of International Concern (PHEIC). Since then, the number of COVID-19 cases has risen at an alarming rate, affecting many other parts of the world either than the epicentre (China) at that time. This led the WHO to declare it a pandemic on 11 March 2020.

Currently, the United States of America and Europe are most affected by the virus, with no exception for the African region. In South Africa, the first positive COVID-19 case was reported on 5 March 2020, to date, the country has recorded more cases of COVID-19 than any other country on the continent.

With the emergence of this novel virus, the immediate task for the NICD was to develop diagnostic assays and collaborate with the National Department of Health and the National Health Laboratory Service (NHLS) to ensure that South Africa's response to COVID-19 was timely and well-coordinated. The NICD needed to dig deep on the skills and lessons gained from dealing with previous outbreaks such as the Ebola outbreak and the recent Listeriosis outbreak in South Africa.

WHAT DOES IT MEAN TO PUT IN EFFORTS TO DEAL WITH COVID-19?

Since the declaration of the COVID-19 outbreak as a PHEIC, the NICD together with the NHLS, the National Department of Health and the South African Government at large, have put several interventions to deal with the pandemic.

President Cyril Ramaphosa announced a 21-day nation-wide lockdown and a further two weeks from 26 March 2020. Before the nationwide lockdown, a national state of disaster was declared in terms of the Disaster Management Act on 11 March 2020, to minimise the spread of COVID-19 by enabling resources and an integrated mechanism through the act to respond to COVID-19.

Through the EOC, the NICD ensures that sufficient resources are rapidly made available and that different aspects of response such as surveillance, outbreak response, diagnostic services, research, training and capacity building are properly coordinated.

The team have worked tirelessly to mobilise laboratory services to test for COVID-19; deployed epidemiologists to provinces and rapitly set up surviallance systems.

WHERE TO FROM HERE?

Transmission rates of COVID-19 continue to rise globally, with South Africa having recorded positive cases and fatalities to date. The battle to save lives through research-driven interventions remains a crucial priority for the NICD as the institution turns its focus to the detection, surveillance and active screening of suspected COVID-19 cases.

WALL OF SCIENTIFIC EXCELLENCE

Prof Nelesh Govender and Andronica Shonhiwa during the 8th FIDSSA congress

BEST MYCOLOGY ABSTRACT LILIWE SHUPING – EPIDEMIOLOGIST

Liliwe Shuping, an Epidemiologist from the Centre for Healthcare-Associated Infections, Antimicrobial Resistance and Mycoses was awarded the best mycology abstract at the 8th Federation of Infectious Diseases Societies of Southern Africa (FIDSSA) congress. Her research abstract titled 'Epidemiology of candidaemia among children in SA hospitals' found that the incidence of candidaemia in hospitals is high (5.3 cases per 1 000 admissions), with a majority of affected children in Gauteng and in public-sector hospitals. Newborn babies were disproportionally affected, representing 49% of the cases. Moreover, her findings highlighted the need to intensify targeted control and prevention efforts among paediatric patients as well as an increasing azole-resistance trend that needs to be mitigated.

BEST ORAL FLASH PRESENTATION ANDRONICA SHONHIWA – EPIDEMIOLOGIST

The Divison of Public Health Surveillance and Response's Andronica Shonhiwa was awarded the best oral flash presentation for her research titled 'Suspected hepatitis A outbreak in residents of an old age home in Johannesburg, Gauteng Province, South Africa, April 2019' at the 8th FIDSSA congress. Her research study found that closed institutions such as care facilities for the elderly are high-risk for hepatitis A virus transmission and outbreaks. Her findings highlighted the importance of having infection prevention and control (IPC) programmes and district adherence to IPC practices. Furthermore, institutions for the elderly and similar settings need IPC to prevent the spread of infectious diseases and outbreaks.

PROF LUCCILE BLUMBERG TO RECEIVE AN HONORARY DOCTORATE

Prof Lucille Blumberg will receive an honorary Doctor of Medicine degree from the University of the Witwatersrand. This will be in honour of her lifetime contribution and excellent leadership in the early intervention, detection, control and surveillance of infectious disease outbreaks for over two decades. Speaking about her honorary doctorate, Prof Blumberg said, "I was overwhelmed.""This is a wonderful recognition of a lifetime's work" she added.

WHO'S NEW?

The NICD Communications Unit has recently expanded to include two key positions that will assist the institution to respond to COVID-19.

Key to the Unit is the inclusion of Siphephelo Kunene, who has worked in the mining, manufacturing, petrochemical and energy, and healthcare sector. Siphephelo holds a Corporate Communications qualification from the University of Johannesburg (UJ) in and is currently completing his Post-Graduate studies at the University of Stellenbosch Business School.

Siphephelo joins the NICD as a Communications Manager and looks forward to adding institutional value pertaining to the NICD's communication operations. ***"I welcome challenges as they present opportunities for new ideas, innovation and growth",*** said Siphephelo.

The second addition is Lesego Sibilanga who joins as a Stakeholder Relations Specialist. Lesego started her career in corporate affairs in one of South Africa's largest Fast Moving Consumer Goods Company. She has worked in the marketing, corporate social investment, stakeholder relations and communication fields.

Lesego's educational background is in Public Management and Governance from UJ. Of interest, Lesego is a strong believer in the power of positive thinking in the workplace and values sharing knowledge. ***"I enjoy photojournalism, writing and exploring new places"*** she said.

STI/CONDOM AWARENESS WEEK

Peggy Gouws at the STI Roadshow event

The Centre for HIV and Sexually Transmitted Infections hosted the STI Roadshow to commemorate STI/ Condom Awareness Week which ran from 10 - 16 February 2020, under the theme 'STOP STIGMA: Communicate, Cooperate, Condomise to Prevent the Spread of Sexually Transmitted Infections.' According to WHO estimates, in 2016, there were approximately 377 million people aged 15 - 49 years newly infected with gonorrhoea, chlamydia, syphilis or trichomoniasis. The estimates correspond to just over 1 million new STI cases worldwide every day.

The roadshow comprised of STI quizzes and Valentine's Day prizes. In an effort to reduce the spread of STIs, the Head of STI Section, Dr Ranmini Kularatne, encouraged participants to heed to the following practices:

- **STOP STIGMA:** around STIs: so that those with infections can access care and treatment without fear of discrimination.
- **COMMUNICATE:** talk freely with our partners about STIs and safe sex practices, also educate our children about STI prevention.
- **COOPERATE:** with each other and with healthcare workers, access treatment if infected and then also refer partners for care.
- **CONDOMISE:** consistent and correct condom use will protect against infection and prevent spread to others.

MALARIA ELIMINATION: A SOCIAL CHANGE PERSPECTIVE

Despite being treatable and preventable, malaria remains a global public health burden, with over 200 million cases and over 400 000 deaths reported in 2018. South Africa has, however, made significant progress in its efforts to roll back malaria and is currently targeting malaria elimination by 2023. The NICD's Centre for Zoonotic and Parasitic Diseases (CEZPD) is currently collaborating with partners that include the Department of Science and Innovation on a ground-breaking technology, the sterile insect technique (SIT), which has the potential to significantly reduce local malaria transmission and help South Africa achieve its elimination goals.

Community engagement in Jozini, KwaZulu-Natal

The backbone of South Africa's strong malaria control programme has been effective vector control, primarily by spraying the inner walls and eves of households in the three malaria-endemic provinces of KwaZulu-Natal (KZN), Mpumalanga and Limpopo with insecticides. While indoor-residual spraying has been very effective in controlling malaria, novel vector tools, like SIT, are urgently required to support elimination efforts and address the rapid spread of insecticide-resistant malaria-mosquitoes (out-door biting and/or out-door resting mosquitoes) and the impact of climate change on malaria.

The science behind SIT's ability to reduce malaria transmission relies on sterile (infertile) male vector mosquitoes mating with fertile female mosquitoes without offspring being produced. Researchers from the CEZPD have successfully demonstrated this under laboratory conditions and are now preparing for field trials. As one can imagine, releasing large numbers of mosquitoes into communities where malaria control has largely focussed on killing mosquitoes is counterintuitive and without the proper community engagement, acceptance is highly unlikely. Very aware of this, the CEZPD developed and implemented a comprehensive community engagement strategy in Jozini, northern KZN, which is the proposed site for the field-testing.

Jozini is ideal as it is very close to eliminating malaria, reporting very few locally-acquired malaria cases from a limited number of localities. Traditional leaders play a significant role in the governance of the community and have been identified as major barriers to development and social change in the region. Therefore, a core component of the community engagement strategy focussed on understanding and addressing the concerns of the traditional leaders. Once their support was garnered, engagements, including imbizos and door-to-doors campaigns with the affected communities and relevant stakeholders were held.

It was during these community interactions that knowledge gaps which had the potential to derail the SIT project were identified. The most surprising misconception identified was that most individuals felt that all mosquitoes, irrespective of species or gender caused malaria, with one resident saying "they all bite" during a community engagement session in November 2019. Based on the feedback received during the community engagements, malaria-focussed health awareness and educational campaigns were initiated to improve the understanding of malaria and increase the acceptance of SIT as a malaria elimination intervention.

By taking the time to identify and address knowledge gaps and concerns of the community, the CEZPD has successfully obtained community acceptance for and approval for the field-testing of SIT later this year. The community engagement strategy employed by CEZPD is a clear demonstration that linking science with community engagement is essential for any social and/or behavioural change.

LEAVE BENEFITS: HOW DO THEY WORK?

At some point in time, we all feel that we deserve a worthwhile break away from the office. In this second instalment of employee benefits, we delve deeper to understand what is in your leave backpack by discussing some of the most common 'knows' you should be aware of when planning to apply for leave.

Leave benefits are not always the ideal getaway holiday destination that we all imagine them to be, they are set for different occasions and are there to assist you when you need to make the most out of them. Every employee is entitled to ten various leave conditions, however, not all of them can be utilised at once and some are more specific to certain needs and requirements than – generally– others.

To put this into perspective, we all know that we cannot all benefit from, for example, maternity nor paternity leave. The conditions are that – for someone who is expecting a child – provisions only apply to new parents; mothers get a period off from work for a duration of four months while the papas only get to be off from work for ten working days (two weeks). Moreover, the Basic Conditions of Employment legislation stipulate the conditions for leave as seen in the infographic below.

Often, the struggle with filling in your leave largely surrounds the type of leave to be taken, let us take, for example, a family emergency; the general rule would be to take 'family responsibility leave.' Great! How about when you have used up all of your 'family responsibility leave' days? The chances are that you can dip into your accumulated leave, annual leave, or worst go to a negative. This is when you have used up all of your leave days but can still count on the fact that your leave accumulates by 1.83 days every month.

Making the best out of your leave benefits comes with knowing what you are entitled to. There are many options that you can access which will give you a breakdown of your leave balance, this includes your monthly payslip, the intranet and by reaching out to the Human Resources department.

Family responsibility
- 5days
- Sick child or spouse and death of immediate family member

Paternity leave
- 10 days
- Birth of a child for male employees

Sick leave
- Every 3 years from date of employment
- A sick note is required for Monday, Friday, the day before or after a public holiday

Sick leave (fixed term with less than 18 months service)
1 day per month

Study leave
- 16 days
- One day to prepare and one day to write; motivation from academic supervisor is required for Masters and PhD write-up

Injury on duty leave
When booked off after a reported injury on duty

Annual leave
- 22 days for permanent employees
- 30 days for permanent employees with 10 years of service and more
- 32 days for permanent employees with 30 years of service and more

Grace lave
- From 1 April to 30 September of every financial year
- Taken from your annual leave balance

Accumulative leave
- Every 1st October 7 days from grace leave moves to accumulative leave
- Employees can save up to 35 days

Special leave
Approved by the CEO or relevant designee

KEEPING SAFE FROM COVID-19: WHAT YOU SHOULD DO IN THE WORKPLACE?

While South Africa has implemented a 21-day nation-wide lockdown and a further two-weeks to delay transmission of COVID-19 and flatten the infection curve, essential services workers, nevertheless, continue to go to work.

The NICD forms an important arm of the South African Government and so does the work it does concerning outbreak response and disease surveillance. A majority of the NICD members of staff are among the essential services required to work during the nation-wide lockdown and have to keep safe from COVID-19 infections while at work. We discuss some of the seven most useful and handy tips that members of staff should make use of while at work.

In light of the imminent influenza season in South Africa, expected to start in May. It is particularly important to vaccinate against influenza. However, keep in mind that influenza vaccine has no known efficacy against COVID-19 and to reduce the pressure on the healthcare system, vaccination of the elderly (>65 years), individuals with cardiovascular disease, individuals with chronic lung disease, pregnant women and people living with HIV and AIDS is important.

NICD AND PARTNERS LEAD EXPERT GENOME TRACING OF SARS-CoV-2


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Conducting whole-genome sequencing (WGS) to understand the genetic material of an organism plays an indelible role in fighting diseases. The fight against COVID-19 is not only limited to response and surveillance activities, however, laboratory diagnosis and detection activities are also equally imperative in informing us with the relevant knowledge on disease compounds and transmission trends.

Scientists from the NICD and the University of the Western Cape's South African National Bioinformatics Institute (SANBI) have produced South Africa's first WGS of SARS-Cov-2 in a report published on virological.org. The isolate was taken from a South African patient who was among the first group of confirmed COVID-19 people in the country, having travelled to Italy. WGS is a laboratory procedure that determines the order of bases in the genome of an organism in one process and provides a very precise DNA fingerprint that can help link cases to one another allowing an outbreak to be detected and solved sooner.

To understand this, the findings of the WGS published 'Whole-Genome Sequence of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) obtained from a South African Coronavirus Disease 2019 (COVID-19) Patient' point out that analysis by Nextstrain showed that the genome clustered together with other genomes from Europe and the United States of America (USA), supports the evidence that the epicentre of the COVID-19 pandemic is now found in these regions. While it is important to note that when comparing the genome sequence to that of Wuhan (China), the genome sequence from South Africa has six differences, yet with strong links that it came from Europe or the USA. This suggests that the importation of COVID-19 in the country is strongly associated with these regions.

Conducting next-generation sequencing of organisms can provide new insights into disease transmission and aid in drug and vaccine design. Finding that an epidemic can only take off as a result of multiple transmissions from an infection, the need to understand transmission routes through WGS offers an even greater opportunity for humanity to actively learn on how to better detect and respond to disease threats. Quoted from the published report, the team submits that "as a contribution to the global efforts to track and trace the ongoing coronavirus pandemic, theirs was to present the sequence, phylogenetic analysis and modelling of non-synonymous mutations for a SARS-CoV-2 genome that was detected in a South African patient with COVID-19.

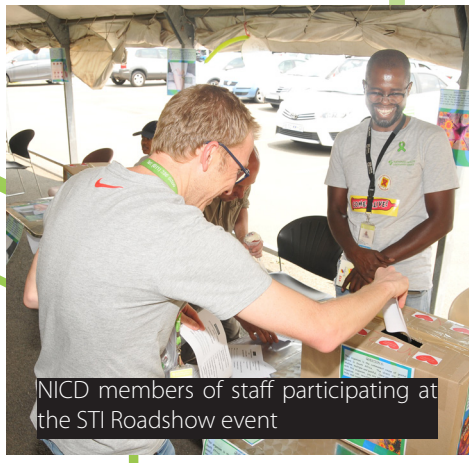
Currently, South Africa as a whole has produced a total of six genome sequences, five by the Kwazulu-Natal Research Innovation and Sequencing Platform and a further three more are expected to be released by the NICD. This will assist the country and the African continent to further knowledge on disease preparedness and response.


Sequencing Core Facility at the NICD

From left: NHLS CEO, Dr Kamy Chetty; Gauteng Health MEC, Dr Bandile Masuku; Minister of Health, Dr Zwelini Mkhize; NICD Interim Executive Director, Prof Lynn Morris and Minister of Home Affairs, Dr Aaron Motsoaledi at the National Emergency Operations Centre

Prof Adrian Puren and Prof Lynn Morris at the World Aids Day event

Mignon Du Plessis at Iphuteng Primary School in Alexandra during the World Pneumonia Day celebration



NICD members of staff participating at the STI Roadshow event

Nkosinathi Mazibuko and Veerle Msimang at the STI Roadshow event

From left: Vuyisile Malinga from SECTION27; Dr Juno Thomas and Dr Natalie Mayet at the World Toilet Day event

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