

HEALTH SCIENCES RESEARCH REVIEW



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RESEARCH

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WHAT'S HAPPENING

20 July - Inaugural Lecture of Professor Mboyo-Di-Tamba Vangu

25 July- 2022 Cricket Research & Practice Conference

Welcome to our July 2022 Faculty of Health Sciences Research Newsletter

The Newsletter is an opportunity for us to present retrospective research article collections to showcase research excellence from the different disciplines in the Faculty, celebrate staff awards and achievements, highlight upcoming events and share general information.

I am pleased to take this opportunity to congratulate Professor Frederick Raal who was awarded an A-rating by the South African National Research Foundation. An A-rating is awarded to leading international researchers in their respective fields. The Faculty is proud to be home to nine of these leaders. Congratulations to our four excellent researchers who were nominated in various categories of the 2021/2022 NSTF-South32 Awards, for their outstanding contribution to Science, Engineering, Technology and Innovation in South Africa. Winners will be announced on the 21st July, 2022.



Professor Maria Papathanasopoulos

Assistant Dean Research & Postgraduate Support: Wits Faculty of Health Sciences

This month we have chosen to highlight the article entitled "The intersecting pandemics of tuberculosis and Covid-19: population-level and patient-level impact, clinical presentation, and corrective interventions" published in *Lancet Respiratory Medicine*. Well done to Harry Moultrie, Neil Martinson, Salome Charalambous, Cheryl Cohen, Stefano Tempia, and collaborators for bringing the major challenges of TB control efforts in the era of Covid-19 into the spotlight. We hope you enjoy reading this article, and others we have included with the links for you to access, read and download.

Lastly, the Faculty Research Day is just around the corner. This is the one day in the Faculty research calendar that you don't want to miss. On 15th September, 2022, staff and students will showcase their research in what promises to be a spectacular Research Day – our first face-to-face event post lifting of all COVID-19 restrictions. Register online and join us in celebrating the various research activities in the Faculty! I would also like to express my gratitude to all the Faculty researchers, students and support staff who work tirelessly to make our Faculty great.

Congratulations to Professor Frederick Raal on being awarded an NRF A1-rating!

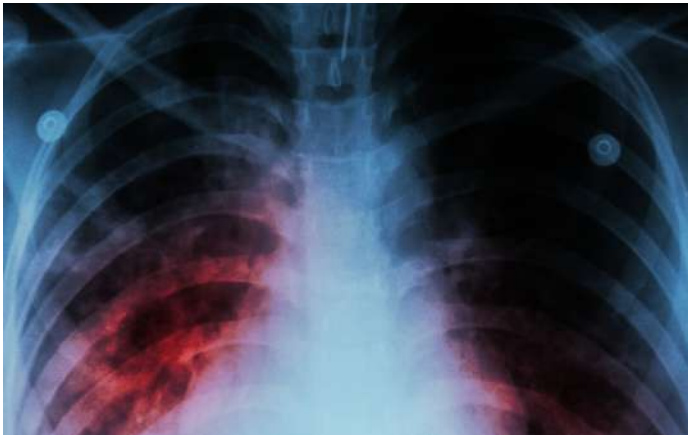


Professor Raal is the Head of the Division of Endocrinology and the Metabolism Director of the Carbohydrate and Lipid Metabolism Research Unit in the School of Clinical Medicine.

Professor Raal has received numerous postgraduate Awards including the TH Bothwell Research Prize, the FJ Milne award, and the University of the Witwatersrand Vice Chancellor's Research Award in 2015.

He has authored or co-authored over 350 original articles and book chapters and has reviewed for several international journals including the *New England Journal of Medicine*, *Lancet*, *Circulation*, and *Atherosclerosis*. He is on the Editorial Board of *Atherosclerosis* and is a Board member of the International Atherosclerosis Society. He was also named the most highly-cited researcher in 2019 and 2021.

Research in high-impact factor journals:



Wits researchers involved: [Harry Moultrie \(WRHI\)](#), [Neil Martinson \(PHRU\)](#), [Cheryl Cohen](#), [Stefano Tempia](#)

The global tuberculosis burden remains substantial, with more than 10 million people newly ill each year. Nevertheless, tuberculosis incidence has slowly declined over the past decade, and mortality has decreased by almost a third in tandem.

This positive trend was abruptly reversed by the Covid-19 pandemic, which in many parts of the world has resulted in a substantial reduction in tuberculosis testing and case notifications, with an associated increase in mortality, taking global tuberculosis control back by roughly 10 years.

Abstract

The researchers consider points of intersection between the tuberculosis and Covid-19 pandemics, identifying wide-ranging approaches that could be taken to reverse the devastating effects of Covid-19 on tuberculosis control. They review the impact of Covid-19 at the population level on tuberculosis case detection, morbidity and mortality, and the patient-level impact, including susceptibility to disease, clinical presentation, diagnosis, management, and prognosis.

The researchers propose strategies to reverse or mitigate the deleterious effects of Covid-19 and restore tuberculosis services. Finally, they highlight research priorities and major challenges and controversies that need to be addressed to restore and advance the global response to tuberculosis.

The intersecting pandemics of tuberculosis and Covid-19: population-level and patient-level impact, clinical presentation, and corrective interventions

Publication Journal:

Lancet Respiratory Medicine (IF 102,64)

Population-level impact of Covid-19 on tuberculosis

Tuberculosis case detection: Compared with 2019, tuberculosis case detection in 2020 was reduced by 18% globally (a decrease from 7.1 million to 5.8 million cases) and up to 24% in the ten worst affected countries with high tuberculosis burden. Major reductions in notified cases have been seen in the Philippines (37%), Indonesia (31%), South Africa (26%), and India (25%).

Previously unpublished data from South Africa's National Institute for Communicable Diseases (NICD) show substantial reductions in tuberculosis testing and case detection nationwide, coinciding with each wave of Covid-19 and the subsequent national lockdown. By May, 2020, tuberculosis testing in South Africa had decreased by more than 50% compared with the previous year.

Conclusion

Covid-19 has set tuberculosis control efforts back by about a decade. This setback will probably translate into long-term increases in tuberculosis-related deaths and structural lung disease. With low rates of SARS-CoV-2 vaccination in tuberculosis-endemic countries and the emergence of new variants, this trend is likely to continue. New strategies involving triage tools and innovative active case-finding interventions require urgent implementation to reverse these alarming trends.

[*Read full study.](#)

Research in high-impact factor journals:

Health and development from preconception to 20 years of age and human capital

Wits researchers involved: [Linda M Richter](#)

Publication Journal: Lancet



Effects of early-life poverty on health and human capital in children and adolescents: analyses of national surveys and birth cohort studies in LMICs

Wits researchers involved:

[Linda Richter](#), [Shane Norris](#)

Publication Journal: Lancet



Treatment guideline concordance, initiation, and abandonment in patients with non-metastatic breast cancer from the African Breast Cancer-Disparities in Outcomes (ABC-DO) cohort in sub-Saharan Africa: a prospective cohort study

Wits researchers involved: [Maureen Joffe](#)

Publication Journal: Lancet Oncology

*[Read full study](#)

Cabotegravir for the prevention of HIV-1 in women: results from HPTN 084, a phase 3, randomised clinical trial

Wits researchers involved: [Linda M Richter](#)

Publication Journal: Lancet



Global, regional, and national disease burden estimates of acute lower respiratory infections due to respiratory syncytial virus in children younger than 5 years in 2019: a systematic analysis

Wits researchers involved:

[Shabir Madhi](#), [Anna Von Gottberg](#)

Publication Journal: Lancet



Cancer in sub-Saharan Africa: a Lancet Oncology Commission

Wits researchers involved: [Lize Maree](#)

Publication Journal: Lancet Oncology



Wits VIDA scientists find that Covid-19 vaccines are safe during pregnancy



A review of Covid-19 vaccines used during pregnancy by Wits scientists shows that vaccination during pregnancy is safe.

The narrative review found that no major safety concerns on the use of mainly messenger RNA (mRNA) Covid-19 vaccines in pregnant women had been identified.

"Although the current Covid-19 vaccines were not tested in pregnant women in the initial clinical trials, information on the safety, immunogenicity and effectiveness of these vaccines has been generated from observational studies," says lead author of the review, Professor Marta Nunes of the Vaccines and Infectious Diseases Analytics (Wits VIDA) research unit in the Faculty of Health Sciences.

The fact that coronavirus disease during pregnancy is associated with a higher risk of stillbirth and preterm birth prompted the review. The review showed that pregnant women mount immune responses to Covid-19 mRNA vaccines comparable to non-pregnant counterparts.

In addition, anti-SARS-CoV-2 IgG [antibodies] were detected in cord-blood following maternal vaccination at concentrations strongly correlated with both maternal antibody levels and the time elapsed since vaccination.

The peer-reviewed evaluation was published in *Trends in Molecular Medicine* on 3 May, 2022.

Messenger RNA vaccines, such as those made by Pfizer and Moderna, use genetically engineered

mRNA that give cells instructions of how to make the S-protein that is found on the surface of the Covid-19 virus.

Vector vaccines, on the other hand, such as those made by J&J and AstraZeneca, work by placing a modified version of a non-pathogenic virus (a vector) – that is different to the virus that causes Covid-19 – into the cells, which then instructs the body to make copies of the S-protein and thus provoke an immune response.

"Vaccination of pregnant women with mRNA Covid-19 vaccines has been shown to be effective in protecting these women against coronavirus disease," says Nunes.

However, further studies of the effect of other Covid-19 vaccines commonly used in South Africa – and specifically in an African context – are required.

Nunes says that most of the Covid-19 vaccine studies she reviewed were conducted in the US and Israel, and a handful in Europe. But there were no studies on the effect of Covid-19 vaccines on pregnant women in low- and middle-income countries (LMICs).

"The review looked mostly at mRNA vaccines, but on the African continent we use many other types of Covid-19 vaccines, such as J&J and AstraZeneca. Furthermore, the population genetics in LMICs, co-morbidities, and lifestyles differ from other countries, so we need studies on the long-term effects of the vaccines used in an African context," says Nunes.

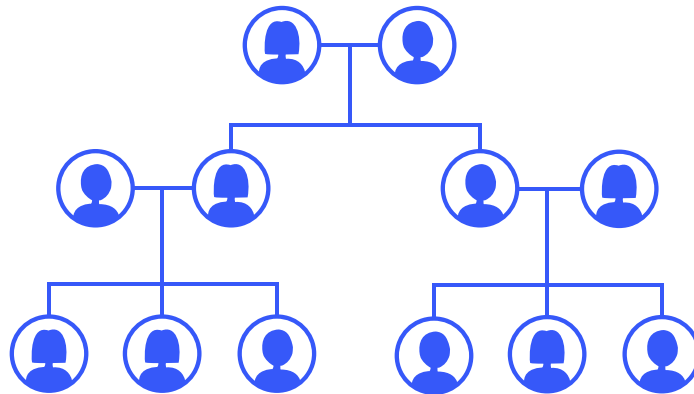
Covid-19 vaccine research continues at a fast-pace and changes rapidly. Although the Wits VIDA review focused on pregnant women, Nunes says there is some literature from the Global North on the effect of Covid-19 vaccines on breastfeeding women.

These studies suggest that the Covid vaccines are safe to use while breastfeeding and that antibodies are actually found in breast milk, thus possibly conferring some protection to infants.

"In South Africa, the recommendation is for pregnant and breastfeeding women to be vaccinated against Covid-19," says Nunes.

[*Read full study](#)

SBIMB publishes the largest African study on the genetic architecture of lipid traits



The Human Heredity and Health in Africa Consortium (H3Africa) AWI-Gen (Africa Wits-INDEPTH partnership for genomic studies) team, led from the SBIMB, recently published the largest African study on the genetics of lipid levels in the journal *Nature Communications* (Choudhury et al. 2022).

In addition, they co-published in *Nature* (Graham et al. 2021) on a large international study on the genetics of lipid traits (Global Lipid Genetics Consortium) that integrated genetic data from 1.65 million people based on 201 independent studies spanning 35 countries.

The AWI-Gen cohort was one of just two continental African cohorts. This consortium's publication showed the importance of diversifying research participants to improve the ability to identify genes and genetic variants that contribute to controlling cholesterol levels.

Professor Ananyo Choudhury, a Reader in the Faculty, and SBIMB colleagues including Professor Michèle Ramsay contributed to these studies.

Ramsay (SBIMB director and AWI-Gen PI) pointed out the important role of the AWI-Gen dataset

"Despite the large sample size of the global lipid study, it had extremely limited African data and the key contribution of our Pan-African cohort was to demonstrate the variability in the predictive ability of the genetic risk models in different geographic regions of the continent"



Prof Michèle Ramsay
Director: SBIMB

She adds that "The results imply that the same genetic risk estimator might perform well in one African population and poorly in another".

Prof Choudhury explains that

"these observations highlight the extreme importance of including African studies with larger samples sizes and more geographic spread, to enable accurate and equitable use of genetic risk scores and its translation to clinical practise".

Prof Ananyo Choudhury
Reader: Wits Faculty of Health Sciences



Genetic risk scores could predict disease in Africans



Using genetic risk scores to predict which individuals have a higher risk genetically of developing a particular disease is set to revolutionise medicine.

The genetic risk scores (GRS) approach to predicting disease risk enables early detection and treatment in a personalised way.

GRS has shown significant progress and potential in European populations. However, applying the approaches developed from European data to African populations shows that GRS are 4.5 times less accurate. This is partly due to the fact that people of African ancestry account for only 1.1% of the global participants in genomic studies.

Why are African genetic studies important?

Underrepresented populations need to feature more in genomic studies so that they benefit from research that explores how their unique genetics affect their health.

A genome is the complete set of genetic information in an organism. It provides all of the information the organism requires to function. In living organisms, the genome is stored in long molecules of DNA called chromosomes. There are 23 pairs of chromosomes in the human genome.

To date, 86% of genomics studies had been conducted in individuals of European descent. For low- and middle-income countries (LMICs), lack of resources such as funds, institutional capacity and a skilled workforce are major barriers to genomic research.

This means that the potential benefits of genomic research – including better understanding of disease etiology [origin], early detection and diagnosis, rational drug design, and improved clinical care – may elude the many underrepresented populations, including Africans.

SBIMB leads African genetic research

A study by scientists at the Sydney Brenner Institute for Molecular Bioscience (SBIMB), with colleagues in Uganda and the UK, set out to understand how compiling genetic information into genetic risk scores from African Americans, Europeans, and multiple ancestries (Asians, Europeans and African Americans) could help identify people who are likely to have high and low lipid levels in African populations.

Lipid (fats) levels refer to the amount of cholesterol and fats (called triglycerides) in the blood. These measurements give doctors a snapshot of lipids in a person's blood. Lipids such as cholesterol and triglycerides in the blood can clog arteries, making a person more likely to develop heart disease.

Such research gives insights into genetic information that can be compiled into GRS to identify African people with high and low lipid levels. This is essential for the early identification of people who are most likely to have elevated levels of lipids in the future.

Professor Michèle Ramsay, the National Research Foundation South African Research Chairs Initiative Chair of Genomics and Bioinformatics in African populations and Director of the SBIMB, states: "The genetic risk prediction for complex diseases and related traits is not yet ready for widespread implementation in a clinical setting.

However, significant advances are being made, primarily in studies with people of European ancestry. It is gratifying that this study, spearheaded by young African scientists and published in a high-impact journal, is highlighting transferability of genetic risk algorithms to African populations. We hope that continued investment and support from funders, pharma, and governments will ensure that genetic risk can contribute to early prediction and preventative strategies to address the burden of non-communicable diseases in Africa."

[*Read more](#)

How obesity plaques the private sector & burdens Health Economics in SA



Research Director
[Evelyn Thsehla](#)



Health Economist
[Micheal Boachie](#)



Senior Researcher
[Agnes Erze](#)



Consultant
[Ciaran Kohli-Lynch](#)

The team at the research to policy unit, PRICELESS SA, has been highly productive over the past few months, with several important publications that relate to NHI in different ways.

The first two manuscripts are important in the context of the burgeoning disease burden of non-communicable diseases. The tsunami of obesity-related diseases now outstrip HIV in South Africa (SA) and are largely driven by commercial determinants. This policy-related research is highly relevant to policy in terms of NHI whilst the minimal resource allocation currently provided to address the prevention, treatment, and rehabilitation of non-communicable diseases.

One of the manuscripts, led by Dr Micheal Boachie and Dr Evelyn Thsehla, assesses the massive costs of obesity in the public sector, which amount to R33.2bn in 2020. This is a serious underestimate for many reasons and only represents costs of managing the conditions themselves and does not include the indirect costs borne by the families of these patients.

The ZAR 33 billion public price tag represents 15.38% of government health expenditure. The largest cost drivers include cancers, respiratory diseases, digestive diseases, diabetes, and high blood pressure.

PRICELESS has also published two innovative manuscripts detailing SA-specific integration of ethics principles from the NHI white paper, into a model framework for the process of priority setting, based on SA's shared values.

The first paper outlines the framework that was developed by a SA multi-sectoral working group, while the second looks at the original methods that were used to develop and refine the Framework. Both of these articles, funded by the Wellcome Trust Grant, are important for SA, which has noted on several occasions its intent to introduce Health Technology Assessment as a process for priority setting.

The second paper by Dr Ciaran Kohli-Lynch with PRICELESS PhD candidate, Agnes Erze, calculated the direct public healthcare costs associated with hypertension to be R 10 billion, while societal costs were estimated to be R 29 billion.

This framework is potentially a useful tool as it provides additional considerations beyond cost effectiveness for adoption of new interventions.



Senior Researcher
Aviva Tugendhaft

The third paper shows that involving communities in a deliberative process is critical for strengthening the priority-setting process for health services.

Led by PhD candidate, Aviva Tugendhaft, the paper was published on modifying and using the Choosing All Together (CHAT) tool in a rural area in South Africa.

The work found that policymakers may benefit from deliberate inclusion of the public – in this case related to Maternal and Child Health. Tugendhaft's analysis found that participatory methods are feasible in the modification of a public engagement tool like CHAT and can be applied in different country contexts to ensure these tools are relevant and acceptable.



Read more PRICELESS SA research!

1. "Estimating the healthcare cost of overweight and obesity in South Africa"

Wits research involved: Michael Boachie, Evelyn Thsehla, Ciaran Kohli-Lynch, Karen Hofman

Abstract

Overweight and obesity presents a major burden to health systems and to society in South Africa. Collectively, these conditions are overwhelming public healthcare. This is happening when the country has embarked on a journey to universal health coverage, hence the need to estimate the cost of overweight and obesity.

[*Read full study](#)

2. "Hypertension in the South African public healthcare system: a cost-of-illness and burden of disease study"

Wits researchers involved: Ciaran Kohli-Lyncha, Agnes Erzse, Karen Hofman

Abstract

High blood pressure (BP), or hypertension, caused an estimated 10.7 million deaths worldwide in 2015 and rates were higher in low-income and middle-income countries. This research paper quantifies the health and economic burden of hypertension in the South African public healthcare system.

[*Read full study](#)

3. "Developing and piloting a context-specified ethics framework for health technology assessment: the South African Values and Ethics for Universal Health Coverage approach"

Wits researchers involved: Susan Goldstein, Aviva Tugendhaft, Karen Hofman

Abstract

The scarcity of ethics analysis in HTA to debates about appropriate methodology and the need for ethics frameworks that are relevant to local social values. The "South African Values and Ethics for Universal Health Coverage" (SAVE-UHC) project models an approach that countries can use to develop HTA ethics frameworks that are specific to their national contexts.

[*Read full study](#)

4. "CHAT SA: Modification of a Public Engagement Tool for Priority Setting for a South African Rural Context"

Wits research involved: Aviva Tugendhaft, Nicola Christofides, Kathleen Kahn, Agnes Erzse, Rhian Twine, Audrey Khoza, Karen Hofman

Abstract

Globally, as countries move towards universal health coverage (UHC), public participation in decision-making is particularly valuable to inform difficult decisions about priority setting and resource allocation. This paper modifies a specific deliberative engagement tool – the CHAT (Choosing All Together) tool for use in a SA rural setting.

[*Read full study](#)

SA research leads to new WHO guidelines for improved TB treatment

The World Health Organization (WHO) has announced key changes to the treatment of drug-resistant tuberculosis (DR-TB), a significant development which will benefit patients with DR-TB in SA and globally. Treatment time has been slashed from 18 months to six, the number of pills reduced from 23 a day to 23 per week, painful injections eliminated and side-effects reduced.

The research also revealed that nine out of every ten patients treated with the new regimen will be cured, offering hope to those who have DR-TB. Through an early access programme, some DR-TB patients in SA are already benefiting from the new regimen.

Under the leadership of Dr Norbert Ndjeka, recently appointed by SA's National Department of Health as chief director of TB, much of this pivotal research was conducted by the University of the Witwatersrand and the Clinical HIV Research Unit (CHRU) as part of clinical trials including the Nix-TB and ZeNix studies conducted by the Global TB Alliance. The trials mostly conducted in SA produced robust data which changed international policy.

Dr Ndjeka explains, "The new WHO guidelines allow almost all forms of DR-TB to be treated with either BPaLM (a combination of bedaquiline, pretomanid, linezolid and moxifloxacin) or BPaL (bedaquiline, pretomanid and linezolid). We welcome the WHO announcement which facilitates rapid implementation of the new regimen."

Pretomanid first received regulatory approval in August 2019 for the treatment of certain forms of highly drug-resistant TB. BPaL was most recently evaluated in TB Alliance's ZeNix trial. The BPaLM regimen was evaluated in the successful TB-PRACTECAL trial, sponsored by Médecins Sans Frontières, in which CHRU participated under the leadership of Dr Mohammed Rassool.

Dr Francesca Conradie, an infectious diseases researcher in the School of Clinical Medicine at Wits, executive director of CHRU's Isango Lethemba TB research unit and principal investigator of the Nix-TB and ZeNix clinical trials, says, "The timing has been



lightning speed from the findings of the clinical trials to the adoption by the WHO of the treatments tested. This achievement speaks to South Africa's TB programme and Dr Ndjeka's visionary approach to addressing TB, which includes a strong focus on rigorous research. Under his leadership, we have been delivering this treatment to those that need it most under the BPaL clinical access programme since March 2021."

"The treatment of DR-TB has been a rapidly changing field in the last 10 years and new medicines for DR-TB have been rapidly incorporated into the South African national TB programme," she adds. Conradie explains that the updates announced by the WHO include shorter novel six-month all-oral regimens for the treatment of multidrug and rifampicin-resistant TB (MDR/RR-TB), with or without additional resistance to fluoroquinolones (pre-XDR-TB). The new regimen consists of only three or four medications, namely, bedaquiline, pretomanid, and linezolid, with the addition of moxifloxacin.

"In addition, based on data from SA's national TB programme, the WHO has also recommended an alternative 9-month all-oral regimen for the treatment of MDR/RR-TB. In this regimen an older drug, ethionamide has been replaced with a newer drug, linezolid. Ethionamide has many side effects that often deter patients from completing their treatment."

According to the WHO, TB remains a threat to global public health and is one of the leading infectious causes of death globally. In 2020, an estimated ten million people developed TB and 1.5 million died from the disease. Owing to the impact of Covid-19, TB incidence could increase globally in 2022 and 2023.

[*Read full article](#)

Multi-morbidities associated with Tuberculosis in South Africa: A Systematic Review of the Literature



Wits HE²RO researchers involved: [Sineke Tembeka](#), [Kamban Hirasen](#), [Lawrence Long](#), [Denise Evans](#)

The concept of multi-morbidity is typically defined as the concurrent existence of more than one infectious and/ or chronic condition in one person. The study was conducted through a systematic review to quantify and describe the extent of multi-morbidities associated with tuberculosis (TB) in SA.

Abstract

South Africa is one of the six countries accounting for 60% of the global Tuberculosis (TB) burden, with an estimated incidence of 615 cases per 100,000 people in 2019. In addition to the country's TB epidemic is an accompanying Human Immunodeficiency Virus (HIV) epidemic with approximately 7.5 million people living with the virus in 2018. In addition, a third epidemic, that of non-communicable diseases (NCDs), has emerged more recently in South Africa. Several medical conditions are risk factors for TB; commonly, these include HIV, diabetes mellitus and malnutrition.

Links between TB and smoking, alcohol abuse, chronic lung disease, cancer and immunosuppressive diseases/illness are also well recognised. Other demographic and socio-economic risk factors such as an unhealthy lifestyle and living in poverty are commonly associated with TB as well as TB co-infection with other communicable diseases, and NCDs.

As such, co-existing communicable diseases and NCDs may increase the risk and/or effect of the other. Subsequently, those already living with a communicable disease such as TB and/or HIV are more likely to develop co-morbidities with NCDs. Understanding these patterns is imperative not only to gain an accurate understanding of disease burden in the country but also to facilitate an integrated health-care approach that could support efficient resource use, higher quality of care and potentially better treatment outcomes.

Why

These latter improvements are particularly important in the context of high disease-burden, resource-limited settings, like South Africa. It is crucial to quantify the extent of multi-morbidities associated with TB and to which demographics, socio-economic and clinical characteristics, treatment outcomes and patient management models have been reported among patients infected with TB and at least one other co-morbid condition.

/cont.

Methods

This systematic review and meta-analysis were developed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA). Searches were conducted in PubMed inclusive of MEDLINE using a combination of keywords 'Tuberculosis', 'HIV', 'Diabetes', as well as other non-communicable disease-related terms. Only studies providing data for South Africa and those published in English from January 2013 to December 2019 were included.

The paper included human studies with both children and/or adults with the simultaneous presence of two or more infectious and/or chronic conditions, where active TB disease was one of the conditions listed. Patients diagnosed with or on treatment for drug-sensitive (DS-TB), drug-resistant (DR-TB), pulmonary (PTB) or extra-pulmonary TB (EPTB) were considered to have active TB disease.

Results

A total of 1772 publications were reviewed, of which 81 (4.6%) were identified for full-text review.

Of these, 17 (21%) publications, representing 23,839 study participants with at least one multi-morbidity, were included in the final analysis.

Human Immunodeficiency Virus (HIV) was the most commonly occurring co-morbidity reported (94.1%), followed by diabetes (35.3%), smoking (23.5%) and alcohol consumption (11.8%). Pooled prevalence estimates for co-morbidities were 65%

HIV is the most common co-morbidity associated with TB in South Africa. However, other prevalent conditions and patient characteristics known to be strongly associated with TB were not consistently reported. Having a holistic understanding of TB and its associated multi-morbidities is critical to prevent further disease development and managing patients with existing multi-morbidities more effectively.

[*Read the full study](#)

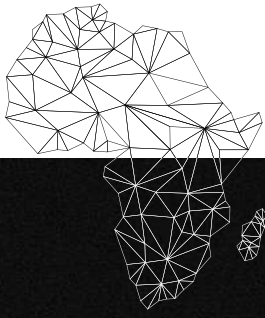


Research Day

Thursday, 15 September 2022

"Research is the quintessential force driving our evolution. In this spirit, the theme for the 2022 FHS Research Day is "Research. For Good." In 2020, we created an extraordinary space for us to gather, discuss, and exemplify the remarkable research accomplishments of our staff and students to attendees within South Africa and abroad. In 2022, we will be returning to the face-to-face format and get to enjoy the classical conference feeling with the addition of a seamlessly integrated online and mobile experience for in-person attendees. We will also be streaming and recording some of the major aspects of the research day for those unable to attend on the day locally or internationally. We aim to make the 2022 edition even more interactive and engaging than before and look forward to once again seeing each other face-to-face!"

- Dr Joshua Davimes, Chair of the Research Day Committee, 2022



THE SCIENCE OF COMPARISONS

Global comparison of communication of end- of-life decisions in the intensive care unit

Are there regional differences in end-of-life communication practices in ICUs worldwide?

Wits researchers involved: [Charles Feldman](#), [Guy Richards](#)

Abstract

Prolonging life in the intensive care unit (ICU) is increasingly possible, so decisions to limit life-sustaining therapies are frequently made and communicated to patients and families/surrogates. Little is known about worldwide communication practices and influencing factors.

The gravity of these decisions and discussions, and the psychological stress that may ensue for all stakeholders, require a supportive environment with a collaborative multidisciplinary team. Importantly, most physician-family conferences appear to lack important elements of communication, such as those related to values and preferences.

Methods

This study is on how communication of end-of-life decisions was practiced worldwide from a multi-

center, international, prospective, observational ICU study of consecutive patients who died or who had limitation of life-sustaining treatment and is an additional, standalone investigation, arising from the global Ethicus-2 study. It included the same patients from the Ethicus-2 study, recruited from 199 ICUs in 36 countries. Participating ICUs were grouped into eight defined geographical regions.

The ICU physician, or their designee, completed the form in each center, for each patient, following a decision to stop life-sustaining treatment, or death, according to the instructions provided.

Results

Of 87,951 consecutive patients admitted to 199 ICUs in 36 countries worldwide, over a mean duration of 5.9 months (range, 1–6 months), 12,850 died or had a limitation of life-sustaining therapy (14.6%).

Of the latter patients 9.3% were known to have an advance directive, 79.6% did not, and this information was not recorded in 11.1% (Table 1). The presence of an advance directive varied by region, with none reported in Africa and 49.3% reported in North America, but was generally very low in all regions outside North America (<13.1%).

[*Read fully study.](#)

Table 1. Clinician knowledge of patient preferences regarding life-sustaining treatments and sources thereof, by region.

	Africa	America Latin	America North	Asia	Australia / New Zealand	Europe Central	Europe Northern	Europe Southern	Total
N of ICUs (cases)	2 (162)	10 (571)	9 (918)	30 (1838)	9 (541)	45 (3893)	37 (2305)	57 (2622)	199 (12850)
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Advance directive	0/66 (0.0%)	17/389 (3.0%)	453/908 (49.3%)	72/1454 (3.9%)	20/523 (3.7%)	511/3624 (13.1%)	59/2097 (2.6%)	67/2369 (2.6%)	1,199/11430 (9.3%)
Patient	1 (25.0%)	3 (3.4%)	63 (7.7%)	18 (1.8%)	36 (9.5%)	218 (10.2%)	119 (10.4%)	11 (1.2%)	469 (7.3%)
Family	3 (75.0%)	67 (76.1%)	492 (60.1%)	885 (88.6%)	223 (59.0%)	1,303 (61.1%)	773 (67.6%)	775 (86.9%)	4,521 (70.0%)
Multiple sources	0 (0.0%)	18 (20.5%)	257 (31.4%)	95 (9.5%)	116 (30.7%)	543 (25.5%)	236 (20.6%)	103 (11.5%)	1,368 (21.2%)
Other	0 (0.0%)	0 (0.0%)	6 (0.7%)	1 (0.1%)	3 (0.8%)	68 (3.2%)	15 (1.3%)	3 (0.3%)	96 (1.5%)

Radiological detection of sharp force skeletal trauma: an evaluation of the sensitivity of Lodox in comparison to CT and X-ray

Wits researchers involved: [Amy Joy Spies \(HVIRU\)](#), [Maryna Steyn \(HVIRU\)](#), [Daniel N Prince \(Diagnostic Radiology\)](#), [Desiré Brits \(HVIRU\)](#).

Abstract

Among the many applications of radiology in a forensic anthropological context is the detection of osteological trauma. The purpose of this research was to explore the ability of virtual imaging to detect and interpret sharp force skeletal trauma. Stabbing trauma using a kitchen knife and hacking trauma using a panga were inflicted upon ten pigs post-mortem.

Methods

Pigs were CT, X-ray and Lodox scanned and the number of lesions visible using each modality was recorded. Pigs were then macerated and the cleaned skeletons were assessed to determine the true number of lesions present. The number of lesions present radiologically was compared to the number present osteologically in order to calculate the sensitivity of each radiological method.

In addition, macroscopic characteristics of each lesion were assessed to evaluate whether the lesion was the result of stabbing trauma with a kitchen knife or hacking trauma with a panga.

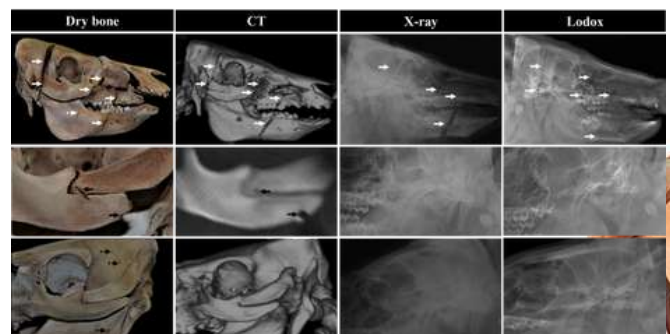
Results

Results indicated that CT is most sensitive and X-rays least sensitive in detecting sharp force skeletal lesions, and as a result, CT is the preferred method for assessing trauma during forensic anthropological examinations. As an alternative to CTs, which may not always be available, Lodox scans should be preferred over X-rays.

However, an assessment of the dry bones in a post-mortem context is always preferable and considered the gold standard. These results are comparable to previously published papers by the same authors evaluating the detection of blunt force

osteological trauma, whereby CT was consistently the most sensitive.

X-rays were shown to be more sensitive than Lodox when identifying blunt force trauma. The examination of sharp force osteological trauma also revealed that determining the type of trauma (stabbing vs hacking trauma) and consequently, the broad class of weapon used (kitchen knife vs panga) was possible radiologically by interpreting various macroscopic characteristics of the trauma.



Copied from Spies *et al*, 2022 ([explore paper here](#))

Figure: Sharp force osteological lesions to the skull. Many of the wide chop marks inflicted with a panga (solid white arrows) were identified by all radiological methods, but some of the more subtle chopping lesions (dashed white arrow)

were only visible on the cleaned skeletons. Some of the very small stabbing lesions inflicted with a kitchen knife (solid black arrows) were identified by CT, but not X-ray or Lodox.

However, other much more subtle stabbing defects (dashed black arrows) were not identified at all radiologically.

[*Read full study.](#)



Mezoneuron benthamianum curbs *Candida albicans* pathogenicity



Research exploring natural-based products that might be valuable in combating the antifungal resistance faced by the most widely used triazole antifungals against *Candida albicans* infections.

Wits researchers involved: [Sibongile Nciki](#), [Zandiswa Gulube](#)

Abstract

Candida albicans is the most prevalent species of *Candida* responsible for superficial infections such as skin, oral and vaginal candidiasis. The pathogenicity of *C. albicans* is attributed to its adherence ability to host cells, formation of hyphae and biofilm, and the production of hydrolytic enzymes such as proteinase and phospholipase.

The organized biofilm communities of *C. albicans* have compromised the efficacy of the widely used triazole antifungals and are implicated in the emergence of antifungal resistance. This is a cause for concern due to the morbidity caused by *C. albicans* infections in immunocompromised populations.

Plant-based natural products are of great importance in the discovery of new therapeutic agents. *Mezoneuron benthamianum* is one of the medicinal plants traditionally used as a chewing stick for treating dental caries and oral infections including oral candidiasis. Thus, this study evaluated the anti-*Candida* activity of *M. benthamianum* leaves by targeting the virulence factors of **C. albicans**.

Methods

The leaves of *M. benthamianum* were collected and extracted using methanol. Anti-*Candida albicans* activity was established using a microtiter plate dilution assay. The effects on the host cell adherence, germ tube formation and phospholipase production were also assessed.

Furthermore, the effect of the plant extract on biofilm formation was evaluated, and *C. albicans*' cells stained with fluorescent dyes were observed using a confocal laser scanning microscopy (LSM 510, Zeiss, Germany).

Results

At 0.39 mg/mL, *M. benthamianum* extract inhibited the growth and the biofilm formation of *C. albicans*. At lower concentrations (50–200 µg/mL), the extract significantly inhibited the adherence ability (up to 51%), formation of hyphae (up to 65%), and the production of phospholipase (\bar{x} Pz value = 1.35±0.06).

Conclusion

At high concentrations, *M. benthamianum* kills *C. albicans*, and at lower concentrations, it can inhibit the virulence properties of this pathogen which validates the traditional medicinal use of this plant.

Further reading on community dentistry

- "[The Knowledge and Participation of Community Health Care Workers in Oral Health Promotion](#)"
- "[Prevalence of Sharps Injuries at a Tertiary Teaching Oral Health Centre, Gauteng, South Africa](#)"
- "[Experiences of doctoral students enrolled in a research fellowship program to support doctoral training in Africa \(2014 to 2018\): The Consortium for Advanced Research Training in Africa odyssey.](#)"



Novel Conjugated Linoleic Acid Iron oxide Nanosystems for Targeted Non-Small-Cell Lung Carcinoma



Lindokuhle M. Ngema
WADDP PhD candidate

Wits researcher supervisors: Samson Adeyemi, Thashree Marimuthu, Yahya E. Choonara

About doctoral candidate

Ngema has completed a Bachelor of Science (BSc) degree with majors in Biochemistry and Microbiology and a Master of Science (MSc) degree in Medical Sciences in Pharmaceutical Chemistry (cum laude). His research aims to develop safe and efficient nanosystems comprised of cytotoxic drugs and biomolecules that enable delivery to tumour-specific targets in the management of NSCLC.

His PhD research will use a scientific approach based on surface molecular engineering of Superparamagnetic Iron Oxide Nanoparticles (SPIONS) and adopts a "safe-by-design" approach where the functionalisation of SPIONS with biomolecules serves to improve overall nanosystem biocompatibility. The research has produced two publications to date, with a further two in progress, with future research outputs envisioned during Ngema's activities as a fellow of the South African Fulbright Foreign Student Program.

Synopsis

The application of Superparamagnetic SPIONS as a nanomedicine for Non-Small Cell Lung Carcinoma (NSCLC) can provide effective delivery of anticancer drugs with minimal side-effects. SPIONS have the flexibility to be modified to achieve enhanced loading of hydrophobic anticancer drugs such as paclitaxel (PTX). The application of SPIONS as a nanomedicine for Non-Small Cell Lung Carcinoma (NSCLC) can provide effective delivery of anticancer drugs with minimal side-effects.

*[Read full study](#)

Forensic imaging: The sensitivities of various imaging modalities in detecting skeletal trauma in simulated cases of child abuse using a pig model



Amy Joy Spies
HVIRU Fellow

Wits research co-authors: Maryna Steyn, Daniel N Prince, Desire Brits

About Dr Spies

Dr Amy Joy Spies has recently completed her PhD in the School of Anatomical Sciences (Human Variation and Identification Research Unit) and has just published the fifth paper from this work.

Synopsis

Physical child abuse is a major problem in South Africa and throughout the world, and the detection of skeletal trauma in victims of abuse may be critical in the accurate investigation of these cases. Since many of these fractures are not detected during traditional autopsy, the use of various diagnostic imaging tools is implemented in order to aid in the detection of trauma.

In South Africa, Lodox (low-dose full-body X-ray) is commonly used in forensic mortuaries and the aim of this study was to assess the sensitivities of CT, X-ray and Lodox, in comparison to dry bone as the gold standard, in detecting both the number of fractures and minimum number of impacts in piglets subjected to blunt force trauma. Ten piglets were beaten with a mallet post-mortem in every region of the body. CT scans were the most sensitive in identifying trauma in all regions of the body

CT scans can be used to assess skeletal trauma in suspected victims of child abuse, but the use of X-ray and Lodox scans is not recommended other than for initial screening procedures. Osteological analysis, however, is still considered the gold standard and should be performed whenever possible.

*[Read full study](#)

Leading Wits scientist discusses new innovative treatment for vestibular schwannoma



Watch the newly appointed Academic Head of the Department of Neuroscience, [Professor John Ouma](#), discuss vestibular schwannoma (acoustic neuroma) treatment.



The Wits Journal of Clinical Medicine is a peer-reviewed open-access scientific journal, created to share the scientific research from the School of Clinical Medicine, Faculty of Health Sciences, University of Witwatersrand, Johannesburg, and from the Clinical Medicine Departments in other institutions in South Africa and internationally. Our objective is to be the primary diffusion portal for Clinical Medical scientists from Southern Africa, using standards that accredit the process of scientific publication.

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School of Physiology hosts world-leading mass spectrometry imaging scientist Professor Per Andrén



The School of Physiology recently hosted [Professor Per Andrén](#), a Professor of Mass Spectrometry at Uppsala University and head of the Spatial Mass Spectrometry ScilifeLab platform.

Mass spectrometry imaging (MSI) has established itself as a valuable analytical approach for mapping multiple molecular species in sections of diverse tissues and it enables simultaneous detection of numerous compounds (from metabolites to small proteins) at relatively high lateral resolution ($>5 \mu\text{m}$). MSI has particularly transformed the pharmaceutical industry with many big pharma companies now establishing their own pre-clinical MSI facilities to fast-track drug development.

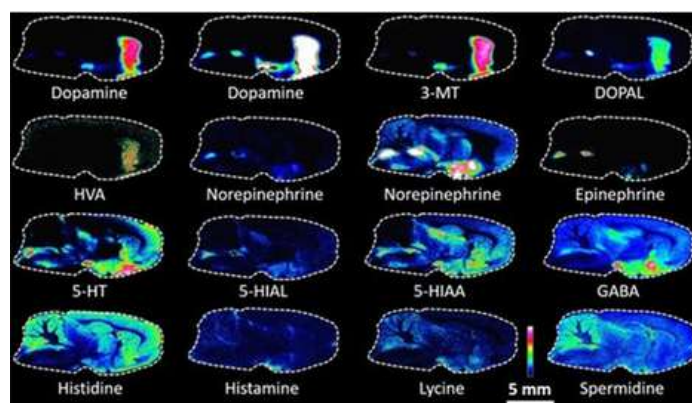
Prof Andrén discussed recent technological advances in mass spectrometry imaging and how they have changed the face of neuropharmacodynamic research. He also shared many novel discoveries from his lab which have contributed to our understanding of levodopa-induced dyskinesia in Parkinson's disease. These were made possible through a significant methodological development in his lab which allows for the simultaneous imaging of multiple neurotransmitters in a single brain section.

These studies have been published in *Nature Methods*, *Nature Protocols*, *Science Advances*, *Molecular Psychiatry* and *Biological Psychiatry*. Head of School, [Professor Willie Daniels](#) added, "Per's visit was inspirational and showed what high-level cutting-edge research can be achieved with the right technology at hand."

This visit was part of a collaboration with [Dr Sooraj Baijnath](#) and Professor Daniels who aim to use this technology to understand the pathological processes underlying depression and to evaluate potential novel treatments. Dr Baijnath spent a year and a half as a researcher at Uppsala University where he developed MSI techniques for *in situ* enzyme histochemistry, while being involved in several other projects.

Dr Baijnath and Prof Andrén have recently published a review in *Trends in Pharmacological Sciences* entitled '[Advances in spatial mass spectrometry enable in-depth neuropharmacodynamics](#)' which highlights the potential of the technique in brain research.

Since his stint in Sweden, Dr Baijnath has brought his skills back to South Africa and joined Wits University. He is working alongside Professor Daniels on bringing this first of its kind technology to South Africa and wider Africa. Acquisition of a mass spectrometry imaging instrument will take biomedical medical research at Wits to another level, enabling spatial omics studies directly on tissue sections. This will contribute to the development of a knowledge-based economy while providing proudly South African solutions to uniquely South African healthcare problems.



An example of a mass spectrometry imaging experiment showing the distribution of multiple neurotransmitters in a single sagittal rodent brain section.



ROUTLEDGE
 ROUTLEDGE
 INTERNATIONAL
 HANDBOOKS

The Routledge Handbook of African Demography

Edited by Clifford O. Odimegwu and Yemi Adewoyin

Wits researcher supervisors: [Clifford O. Odimegwu](#), [Yemi Adewoyin](#)

Book summary

Over the last 50 years, African demography has come of age. It has, particularly, been in transition since 1994. There has been a significant increase in the number of training and research institutions and commensurate growth in the number of specialists in the field.

These have resulted in an increasing number of African contributions to global demographic research and a massive increase in African demographic research outputs. The need to systematically capture these outputs in an authoritative and comprehensive reference resource for the current, emerging and next generations of researchers, and the general public informed this Handbook.

The handbook covers the broad objectives of comprehensively reviewing demographic research findings in Africa by African and Africanist scholars working in the field of African demography; and providing a comprehensive collection of methodological, theoretical and practical issues on the determinants. In addition, the consequences of population change on the African continent; providing exhaustive bibliographies of

African demographic research; and defining future demographic research agenda for the next generation of African demographers as well as population scientists, are all presented in 45 chapters of 914 pages.

Themes covered include demographic training and research in Africa, marriage, fertility, sexual and reproductive health, gender issues, environment, health and development, migration, ageing, mortality and demographic transition.

The case studies discussed in the Handbook span all regions of Africa, including the relatively under-studied Lusophone and Francophone African countries. The contributors, from about 30 countries, are a blend of old, not-so-old, and emerging demographers, population scientists and allied professionals whose works speak to the eclectic nature of the discipline of demography.

The diversities ensure that the Handbook is replete with robust narratives and make it an essential resource for students and researchers of African demography, sociology, human geography, public health and development studies.

[Explore book](#)

NOMINEES NSTF-SOUTH32 AWARDS



Prof Shabir Madhi

Faculty of Health Sciences Dean and the Director of Wits-VIDA is nominated for the NSTF-SOUTH32 Lifetime Award category



Dr Givemore Munhenga

Principal Medical Scientist and Senior Researcher of WRIM is nominated for the TW Kambule-NSTF Award: Researcher category



Dr Roisin E Drysdale

Wits postdoctoral Fellow in the CoE is nominated for the Emerging Researcher Award category



Dr Simone Richardson

Wits postdoctoral Fellow and NICD Senior Scientist is nominated for the Emerging Researcher Award category

AWARDS & RECOGNITION



Prof Maryna Steyn

Director of HVIRU, ASSA Lifetime Distinguished Member Award



Prof Tanya Augustine

Assistant Professor in Anatomical Sciences, one of five awardees of the prestigious 2022 Freidel Sellschop Research Award which was open to all Faculties in Wits University



Sibongile Nciki

Life Sciences Imaging Facility Research Day Second Prize for the best Oral presentation for research titled: "Mezoneuron benthamianum curbs Candida albicans pathogenicity" (SOHS)



Dr Nicolette Comley-White

Physiotherapy lecturer recently obtained her PhD

UNION OF PHYSIOLOGICAL SCIENCES



The photo shows Andrea and Duncan together, during field research in the Karoo region of South Africa.

Two Wits Faculty of Health Sciences physiologists and allied professionals who have made exceptional contributions to physiological sciences have been elected as Fellows into the Academy of the International Union of Physiological Sciences (IUPS). Only 30 Fellows are elected worldwide each year. Last year, Professor Gavin Norton was also elected into this esteemed body.

The School of Physiology was delighted recently to see two of its staff members, Emeritus Professor Duncan Mitchell and Professor Andrea Fuller, were recognised by the IUPS.

The IUPS is the international body that represents physiological societies worldwide and promotes physiology as a scientific discipline, emphasizing its relevance to medicine and global health. The Union comprises of eight scientific commissions, which cover the major fields of physiology.

About Emeritus Professor Duncan Mitchell

Professor Mitchell was recognised for his research, spanning more than fifty years, in thermal, conservation, pain and sleep physiology. He has delivered plenary lectures at five of the four-yearly conferences of the IUPS, including the prestigious Knut Schmidt-Nielsen

Lecture, and served on two of its sub commissions. Sixteen years into his retirement, Professor Mitchell is still writing research papers.

"I am looking forward to being bored one day"

Prof Duncan Mitchell
Emeritus Professor:
Wits Faculty of Health Sciences



About Professor Andrea Fuller

Professor Andrea Fuller was elected to serve on the Council of the IUPS, the governing body that promotes and represents physiology on the international scene. She has been elected as the Chair of the Commission on Comparative Physiology, which oversees research on evolutionary and environmental physiology, including thermal, undersea and gravitational physiology.

It incorporates the Thermal Physiology Commission, of which Professor Cyril Wyndham, former Head of Physiology at Wits, was a foundation member, and which Professor Fuller has also chaired.

"It was an incredible privilege, as a PhD student [attending my first IUPS Conference in 1997, in St Petersburg], to be able to meet and listen to great physiologists, including Jared Diamond, Eric Kandel, and Sir Andrew Huxley. I look forward to the challenge of growing the comparative physiology section of IUPS and inspiring young physiologists"



Prof Andrea Fuller
PERSONAL PROFESSOR:
Wits School of Physiology

GRANTS, BURSARIES & FELLOWSHIPS

Sydney Brenner Charitable Trust Postgraduate fellowship recipients, a celebration of excellence!



Recipients: [Luicer Olubayo](#), [David Twesigomwe](#)

The Sydney Brenner Charitable Trust SBCT awarded two prestigious postdoctoral fellowships to David Twesigomwe and Luicer Olubayo, who are hosted at the [SBIMB](#).

In March, 2022 Prof Michele Ramsay and David attended the meeting "Celebrating the Life and Science of Sydney Brenner" in Cold Spring Harbor Laboratory in the USA.

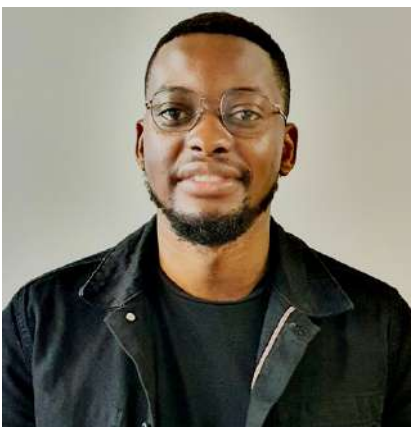
The Sydney Brenner Fellowship aims to contribute to the advancement of biomedical research on the African continent, by providing support to advance the careers of young researchers of African nationality in health-related research. This four-year fellowship includes an annual stipend, computer, funding to

attend conferences and start-up funds for research.

While hosted at the SBIMB, they will also receive training and mentorship from scientists at the University of Edinburgh (UoE), UK, and will spend time there for additional skills development and network opportunities.

The UoE Principal Prof Peter Mathieson was instrumental in facilitating the relationship between UoE and SBCT to form the Wits and UoE partnership in hosting the Sydney Brenner Fellows.

Prof Mathieson was at Wits in May 2022 and was delighted to meet David Twesigomwe, the first recipient of this fellowship.



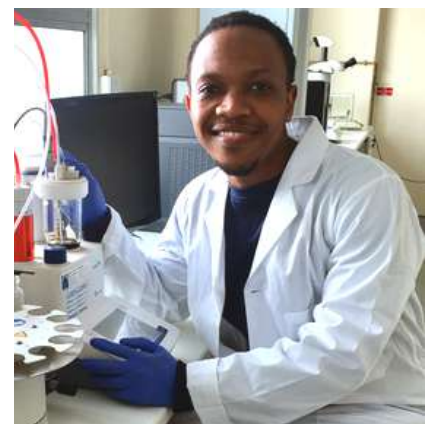
Mashudu Mphaphuli

WADDP PhD candidate selected to participate in the prestigious (and highly competitive) Novartis Next Generation Scientist Program (Basel, Switzerland) starting on 1 July 2022



Agnes Erzse

PRICELESS SA PhD candidate Agnes Erzse won a 2022 Wits Faculty Research Committee individual research grant for her PhD focused on "Addressing social needs to enhance maternal and child nutrition in urban South Africa"



Lindokuhle M. Ngema

WADDP PhD candidate has been awarded a prestigious Fulbright scholarship. His research was also recognised by the Academy of Science of South Africa (ASSAf) and the Department of Science and Innovation (DSI). He was also awarded the Phillip V. Tobias Bursary for 2022

Events

- | | | |
|-------------------|--|--------------------------|
| JUL
20 | <i>Inaugural Lecture of Professor Mboyo-Di-Tamba Vangu</i>
Professor Vangu's lecture titled "MODERN ERA IMAGING WITH PET/CT- A GIFT FROM THE GODS" will discuss the combination of PET and CT technologies has revolutionized the way imaging is performed in clinical medicine. The rapid advances in instrumentation and novel imaging tracers are continuously changing the face of both research and clinical practice. | Register |
| JUL
25 | <i>2022 Cricket Research & Practice Conference</i>
The conference will live up to its theme, #gamechangingresearch, by bringing researchers, coaches, sports scientists, biokineticists, physiotherapists, sports physicians, strength and conditioning trainers, sports coordinators, sports managers, players together through scientific discussions, informal conversations, and lots of fun. | Register |
| JUL
26 | <i>Talking Monkey Pox: A second Pandemic or One to Ignore</i>
Join the Deputy Director of the National Institute for Communicable Diseases (NICD) as she discusses the bioethical considerations of the smallpox vaccine, vaccine efficacy and vaccination policy for a potential monkeypox outbreak in South Africa, | Register |
| JUL
26 | <i>Wits Pharmacy/ISORBE Radiopharmacy Online Seminar</i>
The Wits Department of Pharmacy and Pharmacology and the International Society of Radiolabeled Blood Elements (ISORBE) invites you to join nuclear medicine experts from South Africa, USA, Argentina, Spain, UK and Austria to learn the latest developments in radiolabeling and imaging. | Register |
| JUL
28 | <i>Wits UpToSPAED Conference: 28 - 30 July 2022</i>
The two day scientific programme including tails on ethics and advocacy, COVID and vaccines, neonatology, pulmonology, emergency medicine and critical care. There will also be various exciting panel discussions. CPD points including ethics points | Register |
| AUG
24 | <i>2022 Health Sciences Student Success Conference</i>
The Office of Student Success invites researchers, practitioners, health sciences staff and students to show case innovations, high-impact practices and students experiences as they affect overall student success and well-being. The conference will also serve as a forum for participants' personal transformative experience, networking and developing collaborative relationships. | Register |
| SEPT
15 | <i>FHS Research Day 2022</i>
The Research Day is designed to maximize opportunities for interaction among participants around the objectives. Dedicated time will be given to both oral and poster presentations within the schedule. <i>Registration deadline- 22 August 2022</i> | Register |



Want your research or research-related news to be featured?
Email your submission to didi.mmatladi@wits.ac.za

The Faculty of Health Sciences Research Office offers a wide range of research courses and workshops.

[Learn more](#)

2022 **Wits Faculty Of Health Sciences** IN NUMBERS

WORLD RANKINGS

TOP 100

Public Health

Shanghai Ranking 2022

TOP 150

Clinical Medicine

Shanghai Ranking 2022

TOP 300

Medicine & Dentistry

Times Higher Education 2022

262ND WORLDWIDE

Life Sciences & Medicine

QS Ranking 2022

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