SOUTH AFRICAN MEDICAL RESEARCH COUNCIL
The South African Medical Research Council (SAMRC) was established in 1969 to conduct and fund health research, health innovation, development and research translation. The SAMRC focuses on the top ten causes of mortality, co-morbidities, disability and associated risk factors. The scope of research includes laboratory investigations, pre-clinical and clinical research, and public health studies.

The mandate of the SAMRC is legislated in terms of Act 58, 1991 (as amended): ‘the objects of the SAMRC are, through research, development and technology transfer, to promote the improvement of the health and quality of life of the population of the Republic, and to perform such functions as maybe assigned to the SAMRC by or under this Act’.

VISION
Building a healthy nation through research, innovation and transformation.

MISSION
To advance the nation’s health and quality of life and address inequity by conducting and funding relevant and responsive health research, capacity development, innovation and research translation.

SAMRC VALUES
The SAMRC is guided by the following values that form the foundation of our organisations:

Pioneering: We push the boundaries between the known and the unknown to further our knowledge of human health within the prescripts of responsible (ethical) conduct of research.

Partnering: We celebrate the capacity of collective minds towards a common goal. We build partnerships with many stakeholders at local, national, regional and international levels to exchange ideas, advance shared goals, optimize use of resources to minimise duplication, and leverage funding.

Excellence: We strive for distinction in everything we do by developing highly skilled personnel, capacity building and transformation, and conducting research of high value.

Respect: We value and respect our communities, participants, researchers and funders.

Integrity: We commit to transparency, accountability, open communication and ethical conduct.

Citizenship: We demonstrate responsibility to the community, nation and the World.
GOALS

1. Administer health research effectively and efficiently in South Africa

2. Lead the generation of new knowledge and facilitate its translation into policies and practices to improve health

3. Support innovation and technology development to improve health

4. Build capacity for the long-term sustainability of the country’s health research

5. Translate new knowledge into policies and practices to improve health
ABOUT THE EXTRAMURAL UNITS

SAMRC research Units (both Intramural research Units [IMUs] and Extramural research Units [EMUs]) are the prime vehicles for delivering relevant and responsive health research outputs to address both national and international health issues. While IMUs focus their research activities on public health challenges and some of the major burdens of disease in the country, EMUs undertake research from the bench to the community in strategic research areas not covered by the IMU programme, generating new knowledge and growing the next generation of health scientists for the country. EMUs are based in higher education institutions (mainly universities) and other research-intensive organisations such as the National Health Laboratory Service. EMUs enable the SAMRC’s funding to support long-term programmes of research across a range of institutions of higher education across the breadth of South Africa’s Provinces and enable cutting edge research focusing on diverse health challenges to be positioned at the interface with training and developing the next generation of health professionals and scientists.

The SAMRC’s EMUs are provided with a secure, discretionary, financial incentive which is approved in five-year cycles, up to a term limit of 15 years depending on satisfactory performance. It is expected that institutional support and co-funding and the other grants received by the Unit will exceed by several-fold the amount invested by the SAMRC in the Unit.

This report synthesises data from the Annual Research Reports submitted by EMUs for the 2022/23 Financial Year and presents highlights of the impact of the EMU research efforts.
<table>
<thead>
<tr>
<th>SAMRC EXTRAMURAL UNITS</th>
<th>UNIT DIRECTOR</th>
<th>INSTITUTION</th>
<th>DATE OF ESTABLISHMENT</th>
</tr>
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<tbody>
<tr>
<td>Antibody Immunity</td>
<td>Prof Penny Moore</td>
<td>University of the Witwatersrand</td>
<td>2019</td>
</tr>
<tr>
<td>Antimicrobial Resistance and Global Health</td>
<td>Prof Pascal Bessong</td>
<td>University of Venda</td>
<td>2022</td>
</tr>
<tr>
<td>Antiviral Gene Therapy</td>
<td>Prof Patrick Arbuthnot</td>
<td>University of the Witwatersrand</td>
<td>2015</td>
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<tr>
<td>Bioinformatics Capacity Development</td>
<td>Prof Alan Christoffels</td>
<td>South African National Biodiversity Institute</td>
<td>2001</td>
</tr>
<tr>
<td>Cardiometabolic Health</td>
<td>Prof Tandi Matsha</td>
<td>Cape Peninsula University of Technology</td>
<td>2019</td>
</tr>
<tr>
<td>Centre for the Study of Antimicrobial Resistance</td>
<td>Prof Keertan Dheda</td>
<td>University of Cape Town</td>
<td>2018</td>
</tr>
<tr>
<td>Centre for Health Economics and Decision Science</td>
<td>Prof Karen Hofman</td>
<td>University of the Witwatersrand</td>
<td>2019</td>
</tr>
<tr>
<td>Child and Adolescent Lung Health</td>
<td>Prof Heather Zar</td>
<td>University of Cape Town</td>
<td>2015</td>
</tr>
<tr>
<td>Development Pathways for Health</td>
<td>Prof Shane Norris</td>
<td>University of the Witwatersrand</td>
<td>2010</td>
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<tr>
<td>Drug Discovery and Development</td>
<td>Prof Kelly Chibale</td>
<td>University of Cape Town</td>
<td>2009</td>
</tr>
<tr>
<td>Genomics of Brain Disorders</td>
<td>Prof Soraya Seedat</td>
<td>Stellenbosch University</td>
<td>2019</td>
</tr>
<tr>
<td>Health Services to Systems</td>
<td>Prof Helen Schneider</td>
<td>University of Western Cape</td>
<td>2015</td>
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<tr>
<td>Herbal Drugs</td>
<td>Prof Alvaro Viljoen</td>
<td>Tshwane University of Technology</td>
<td>2015</td>
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<tr>
<td>HIV-TB Pathogens and Treatment</td>
<td>Prof Salim Abdool Karim</td>
<td>CAPRISA</td>
<td>2015</td>
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<tr>
<td>Hypertension and Cardiovascular Disease</td>
<td>Prof Marlien Pieters</td>
<td>North West University</td>
<td>2015</td>
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<tr>
<td>Intersection of Non-communicable Disease and Infectious Disease</td>
<td>Prof Ntobeko Ntusi</td>
<td>University of Cape Town</td>
<td>2022</td>
</tr>
<tr>
<td>Masculinity and Health</td>
<td>Prof Ashley van Niekerk</td>
<td>University of South Africa</td>
<td>2019</td>
</tr>
<tr>
<td>Maternal and Infant Health Care Strategies</td>
<td>Prof Robert Pattinson</td>
<td>University of Pretoria</td>
<td>1998</td>
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<tr>
<td>Microbial Water Quality Monitoring</td>
<td>Prof Anthony Okoh</td>
<td>University of Fort Hare</td>
<td>2015</td>
</tr>
<tr>
<td>Pan African Centre for Epidemics</td>
<td>Prof Nancy Phaswana-Mafuya</td>
<td>University of Johannesburg</td>
<td>2022</td>
</tr>
<tr>
<td>Platform for Pharmacogenomics Research &amp; Translation</td>
<td>Prof Collet Dandara</td>
<td>University of Cape Town</td>
<td>2022</td>
</tr>
<tr>
<td>Precision Oncology</td>
<td>Prof Zodwa Dlamini</td>
<td>University of Pretoria</td>
<td>2019</td>
</tr>
<tr>
<td>Risk and Resilience in Mental Disorders</td>
<td>Prof Dan Stein</td>
<td>University of Cape Town</td>
<td>2017</td>
</tr>
<tr>
<td>Rural Public Health and Health Transition</td>
<td>Prof Stephen Tollman</td>
<td>University of the Witwatersrand</td>
<td>2003</td>
</tr>
<tr>
<td>Stem Cell Research and Therapy</td>
<td>Prof Michael Pepper</td>
<td>University of Pretoria</td>
<td>2015</td>
</tr>
<tr>
<td>Unit for Precision and Genomic Medicine</td>
<td>Prof Rajkumar Ramesar</td>
<td>University of Cape Town</td>
<td>2018</td>
</tr>
<tr>
<td>Vaccine and Infectious Analytics</td>
<td>Prof Shabir Madhi</td>
<td>University of the Witwatersrand</td>
<td>2020</td>
</tr>
<tr>
<td>Wound and Keloid Scarring Translational</td>
<td>Prof Nonhlanhla Khumalo</td>
<td>University of Cape Town</td>
<td>2019</td>
</tr>
</tbody>
</table>
PROFILE OF UNIT DIRECTORS

**EMUs**
- Total: 28

**Race**
- African: 32%
- Coloured: 7%
- Indian: 18%
- White: 43%

**Gender**
- Male: 64%
- Female: 36%

**Not Rated**: 5
**C-Established**: 10
**B-Internationally Acclaimed**: 8
**A-Leading International**: 5
EMU portfolio needed transformation and diversity


24% 26% 26% 36%
Female  Female  Female  Female

41% 42% 57%
Black  Black  Black

PROFILE OF HOSTING INSTITUTIONS

The SAMRC has Units in 14 institutions and is committed to the capacity development of HDIs; of the 14 institutions, 5 are HDIs.
RESEARCH OUTPUTS

EMUs produced 692 peer-reviewed publications in 2021/22; ~49.6% of the total SAMRC research output.

Of the 692 peer-reviewed publications from the EMUs, 54% were first/last authored by researchers from the EMUs.

OVERVIEW OF THE STAFF COMPLIMENT

Established researchers
H-index bigger than ≥20

NRF Rated
A = 6%    C = 53%
B = 13%   Y = 28%

Gender
Females = 70     Males = 30
KEY FINDINGS FROM EMU RESEARCH

- The **Antibody Immunity Research Unit** served as an end-point lab for humoral assays, which enabled the identification of a protective titer to be determined for the HVTN 703/704 AMP trial. The Unit also led the phenotypic characterization of breakthrough viruses and made continued contributions to understanding how broadly neutralizing antibodies develop during infection, to apply as a template for HIV vaccine design.

- The **Bioinformatics Capacity Development Research Unit** identified a methylation CpG signature capable of predicting the amplification of MYCN, a predictor of poor prognosis, in the early stages of neuroblastoma. This achievement has the benefit of helping clinicians design better treatment for patients with MYCN amplification.

- In collaboration with Stellenbosch University, the **Cardiometabolic Health Research Unit** showed that several biochemical markers could predict the severity of Covid 19.

- The **Centre for Health Economics and Decision Science Research Unit** provided inputs to the South African pregnancy grant which is an extension of the child support grant. The Unit demonstrated the feasibility of the grant by showing its cost effectiveness in reducing healthcare costs and improving infant mortality rates, while addressing multidimensional poverty among pregnant mothers during the first 1000 days of life.

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- The **Intersection of Noncommunicable Diseases and Infectious Diseases Research Unit** contributed to the largest study of the epidemiology and outcomes of cardiovascular disease in individuals with COVID-19. This research was conducted under the auspices of the World Heart Federation.

- The **Maternal and Infant Health Care Strategies Research Unit** has put together a training manual (Training materials and guidelines for anthropometric assessment in the National Dietary Intake Survey 2022 (NDIS-2022)). This manual includes all anthropometric measurement protocols, guidelines for trainers and guidelines for post-training testing and standardisation.

- In a series of publications, the **Platform for Pharmacogenomics Research and Translational Unit** clearly showed that African populations carry some African specific variants, that are important determinants of drug response, particularly warfarin & hypertension.

- Urbach-Weithe disease is a rare condition, in which there is damage to the basolateral amygdala. In a paper published in PNAS, one of the world’s leading scientific journals, the **Risk & Resilience in Mental Disorders Research Unit** showed that basolateral amygdala damage leads to changes in the way moral judgments are made – a key finding for work on the neurocircuitry of ethical decision-making.

- The **Rural Public Health and Health Transitions Research Unit** launched a new, community-based Data Sciences and Innovation Hub based in Mpumalanga (Agincourt village).

- The **Genomic and Precision Medicine Research Unit** led the first clinical trial that included a South African cohort of colorectal cancer patients, who were chosen since they already had their disease-causing mutation identified. The findings show that the application of simple aspirin and starch delays the onset of colorectal cancer significantly in these high-risk individuals (by more than 10 years).

- The **Vaccines and Infectious Diseases Analytics Research Unit** has made significant contributions to new generation COVID vaccines including evaluating the safety, immunogenicity, efficacy, and effectiveness of COVID-19 vaccines. That body of work included a Phase 1 SARS-CoV-2 vaccine study to assess the safety and tolerability of a vaccine candidate administered in healthy adult participants and people living with HIV, a phase 1/2 open-label study assessing the safety, reactogenicity, and immunogenicity of saRNA COVID-19 boost vaccines in participants that have been previously vaccinated against or previously infected with COVID-19, and a phase 1/2 study to evaluate the safety, reactogenicity and immunogenicity of three investigational vaccines developed to address the SARS-CoV-2 virus and all developed on the same RNA manufacturing platform.
CONTRIBUTION TO CAPACITY DEVELOPMENT

**698 Students**
Registered within the EMUs

**Gender Representation**

**Race**

**100 Students** were funded from the SAMRC Funding pockets (EMU baseline, SHIP, RCD ect)

EMU capacity development prioritises the training of future research leaders.

More Females are being trained within the EMUs

More Black students are being trained within the EMUs

More South African students were funded

Training South African students takes priority in EMUs, however the SAMRC brand also attracts students from other African countries and elsewhere in the globe.
OUTPUT OF CAPACITY DEVELOPMENT

110 students graduated in 2022/23.

56 MSc students graduated

54 PhD students graduated
Partnerships and collaborations are mechanisms by which capacity is built and research skills are exchanged. In ensuring that projects have the desired outcomes and contribute to the enhancement of national priorities, EMUs form partnerships that drive our country’s research agenda and our efforts to generate knowledge to address the country’s health problems.

There are currently 336 EMU Collaborations for the 2022/23 FY; indicative of mechanisms by which research skills and practice knowledge is exchanged, developed and enhanced.

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**STAFF/STUDENT MOVEMENT**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Institution</th>
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<tbody>
<tr>
<td>58%</td>
<td>University</td>
</tr>
<tr>
<td>15%</td>
<td>Pharmaceutical industry</td>
</tr>
<tr>
<td>13%</td>
<td>Promoted within EMU</td>
</tr>
<tr>
<td>4%</td>
<td>Research Council</td>
</tr>
<tr>
<td>4%</td>
<td>Government agency</td>
</tr>
<tr>
<td>3%</td>
<td>Research Institute</td>
</tr>
<tr>
<td>1%</td>
<td>Consulting company</td>
</tr>
<tr>
<td>1%</td>
<td>Hospital</td>
</tr>
<tr>
<td>1%</td>
<td>Bank</td>
</tr>
</tbody>
</table>

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**Diagram:**

- Local collabs: 134
- EMU/IMU collabs: 26
- International collabs: 176

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**Career Path:**

- University
- Pharmaceutical industry
- Promoted within EMU
- Research Council
- Government agency
- Research Institute
- Consulting company
- Hospital
- Bank
FUNDING RAISED BY THE EMUS

The total funding received by EMUs in 2022/23 was

~R 983,000,000

R 982,993,648

The total SAMRC Funding received by EMUs in 2022/23 is

~R 129,000,000

R 129,026,437

The total leveraged funding (non-SAMRC) received by EMUs 2022/23 is

~R 854,000,000

R 853,967,210

The EMU baseline + incentivised funds received in 2022/23 is

~R 34,000,000

The total funding from other SAMRC Programmes (RCD, SHIP, Flagship, etc) received by EMUs in 2022/23 is

~R 95,000,000

R 95,026,437

AWARDS RECEIVED BY EMU STAFF

The number of local and international awards is a reflection of the national and global stature of the EMU research.

Local Awards

International Awards

32

22

54 awards were received by EMUs.
FEATURED HEADLINES OF SELECTED EMUS

‘Passage of mental health bill not enough for Nigerians’
by Sade Opontola — November 17, 2022 in Health Reading Time: 2 mins read

Prof Karen Hofman, Professor at Uits speaks to Lester Kieni about the energy drinks flooding the market.

- Health economist, Professor Karen Hofman says companies like Coca-Cola are flooding Sub-Saharan Africa with energy drinks.
- Hofman says the companies promote the drinks as a magic elixir to enhance performance, which says she says they are not.
- Aggressive advertising and marketing campaigns are hooking people at a younger age, she adds.

THE LANCET
Child & Adolescent Health

Early childhood wheezing phenotypes and determinants in a South African birth cohort: longitudinal analysis of the Drakenstein Child Health Study
Carlyle McCready, MSc, Sade Okodu, PhD, Profs Francesca Usta, MD, PhD, Profs Mark Hkeletal, PhD, Leopold Verkleij, MD, PhD, Rupen Dandona, PhD, Prof Denis J. Pieper, MD, PhD

Japan to honour SA’s spouse scientists for HIV and Covid-19 work

Suthemba Gwonde

The Japanese government will award the prestigious Keihin Mitoji Nagasaki Africa Prize to two exceptional couple, professors Suthemba Gwonde from the University of Johannesburg and his wife, Ophelia Gwonde, for their rigorous work on HIV and Covid-19.

They will be honoured in the medical research category, while the Carter Centre in the US will receive recognition in the medical services category for its work in the global worm eradication programme.

THE LANCET

Ntobeko Ntusi: valuing a culture of inclusivity and reciprocity

Published: December 18, 2021

Ntobeko Ntusi, a South African researcher and health advocate, has been awarded the prestigious Keihin Mitoji Nagasaki Africa Prize for her work in the field of health equity.
John Myburgh speaks to the dean of the Faculty of Health Sciences at the University of the Witwatersrand, Prof Shabir Madhi, about the concerns of the Centaurus COVID-19 sub-variant.

The World Health Organization (WHO) has warned countries across the world of a new and highly mutated COVID-19 sub-variant called Centaurus.

The variant has been identified as BA.2.75 and is part of the Omicron lineage.

It has been identified in 10 countries such as India, Australia, New Zealand, Japan, United States of America, United Kingdom, and Germany.

CapeTalk’s John Myburgh spoke to the University of the Witwatersrand’s dean of health sciences, Professor Shabir Madhi, about the newly discovered variant.

Madhi added that despite the Centaurus sub-variant not being detected in South Africa, people are advised to get vaccinated to protect themselves against the variant.

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**Shabir A. Madhi**

Dean Faculty of Health Sciences and Professor of Vaccinology at University of the Witwatersrand, and Director of the SAMRC Vaccines and Infectious Diseases Analytics Research Unit, University of the Witwatersrand

Shabir Madhi is dean of Faculty of Health Sciences and Professor of Vaccinology at the University of the Witwatersrand, Johannesburg, South Africa; and co-founder and co-Director of the African Leadership Initiative for Vaccinology Expertise (ALIVE). Professor Madhi completed his undergraduate and postgraduate training at the University of the Witwatersrand, qualifying as a paediatrician in 1996 and obtaining his PhD in 2003.

He currently also holds the positions of Director of the South African Medical Research Council Vaccines and Infectious Diseases Analytics Research Unit. He served as the immediate past Director of the National Institute for Communicable Diseases (2011-2017), and currently serves on the South African National Advisory Group on Immunisation and is member of the World Health Organisation Strategic Advisory Group of Experts on Immunization (SAGE) since 2019.

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**How do you know if you may be depressed? Here’s what happens to your body – and other tell-tale signs**

Zalikitho Ezikheni

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**Obesity’s heavy price: Scientists and activists want more prevention in place**

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**Cancer researcher calls for more targeted treatment approach**

Jonathan duToit

Created: Feb 13, 2022 07:54 AM

2 Comments