

ANNUAL REVIEW 2018 20 Years of Enabling Research Excellence



CONTACT INFORMATION

WITS HEALTH CONSORTIUM

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EXECUTIVE SUMMARY



The Wits Health Consortium (Pty) Ltd (WHC) is a private, wholly owned company of the University of the Witwatersrand, Johannesburg (Wits). WHC was established as a result of an initiative from the Faculty of Health Sciences which proposed the Company in order to unlock commercial opportunities that would provide additional sources of revenue for the Faculty and its Departments. Council approved the Faculty's proposal in October 1997 and the Company was registered in 1998.

All academic endeavors are directed, managed and controlled through the University structures with WHC research active staff joint appointed with the University conducting research, managing donor-funded activities, clinical trials and pursuing entrepreneurial innovation in health.

WHC operates a Shared Services Centre (SSC) and several key subsidiary businesses.

INTRODUCTION

The Wits Health Consortium (WHC) was formed in 1998 as an entity through which the Faculty of Health Sciences is able to undertake third stream income activities. This is done while supporting academic research and the management of donor funding for research as well as related activities in the medical and health sciences industry. We have numerous research entities that we service and they operate in South Africa, across the African continent, in the US as well as Europe.

We are the enabling environment for an entrepreneurial approach to academia. We perform this role through our Shared Services Centre (SSC), which employs over 263 skilled staff. By doing what we do well, we free up our internationally renowned academics and researchers to do what they do best we enable them to pursue specialist research in their respective fields of expertise.

This report provides an overview of our operations and highlights the success of our research units and their achievements during 2018.

WHC Shared Support Centre (SSC): These are entities are in support of WHC academic activities and the Faculty of Health Sciences strategy

We operate a SSC to support research activities and provide the following support:

- Financial Administration
- Contract and Legal Services
- IT Solutions
- Human Resource Management
- Training and Development
- Payroll Services
- Research Ethics
- Clinical Trials
- Grant Management
- Internal Audits
- Continuing Professional Development

OUR SUBSIDIARIES

Some of our subsidiary companies have been created from collaborations in syndicate projects. Others have emerged as we realised the value they could add to our business on an ongoing basis. Our subsidiaries are dynamic and value-adding operations that all deliver service excellence and specialist services.

Speer IT Services and Solutions:

Software, IT systems, network connectivity and cloud storage and management solutions.

Integrated Health Delivery Network:

Self-funding clinical health centres and medical teaching platforms that offer affordable and quality healthcare.

Academic Advance:

Good Clinical Practice courses and training, conducted in line with CPD requirements for the Health Professions Council of South Africa.

Ukwenza Print and Graphics Studio:

Graphic and web design, print and multi-media production and research data collection and design.



2018 FINANCIAL OVERVIEW

Our financial overview gives us the opportunity to provide a view of the financial position of Wits Health Consortium.



WITS HEALTH CONSORTIUM PROPRIETARY LIMITED

Statement of profit or loss and other comprehensive income for the year ended 31 December 2018

	2018	2017
	R	R
Surplus before operating expenses	2,137,192,081	2,011,873,550
	1	
Operating expenses	-2,078,128,360	-2,022,985,613
Personnel costs	1,291,862,312	1,145,688,792
Consultants	75,078,489	106,757,226
Depreciation	50,260,250	40,801,148
Operational costs	555,530,962	626,918,568
Travel costs	92,325,524	86,636,373
Training costs	13,070,823	16,183,506
	_	
Surplus/(loss) before net finance income	59,063,721	-11,112,063
Net finance income	46,439,951	44,400,579
Surplus before income tax	105,503,672	33,288,516
Income tax expense	-219,387	-209,255
Surplus for the year	105,284,285	33,079,261
Attributable to		
Core	15,730,637	16,705,604
Syndicates - Restricted		
Syndicates - Unrestricted	88,997,482	16,373,657
	1	1
Dividend declared to the University of Witwatersrand, Johannesburg	10,900,000	11,000,000

WITS HEALTH CONSORTIUM PROPRIETARY LIMITED

Statements of financial position at 31 December 2018

	2018	2017
	R	R
ASSETS		
Non-current assets		
Property, plant and equipment	225,023,490	167,258,848
Goodwill	485,608	485,608
Deferred tax	84,317	39,867
	225,593,415	626,918,568
Current assets		
Inventory	1,066,702	1,354,611
Trade and other receivables	477,231,920	297,163,351
Tax receivable	110,042	23,280
Cash and cash equivalents	1,063,363,996	901,983,712
	1,541,772,660	1,200,524,954
Total assets	1,767,366,075	1,368,309,277
EQUITY AND LIABILITIES		
Equity		
Share capital	100	100
Accumulated reserves	467,918,659	373,834,374
	467,918,759	373,834,474
Non-current liabilities		
Borrowings	20,643,480	1,101,337
Lease liability	11,925,600	
	32 569 080	1 101 337

WITS HEALTH CONSORTIUM PROPRIETARY LIMITED

Statements of financial position at 31 December 2018

Current liabilities		
Borrowings	2,120,954	554,039
Lease liability	4,079,741	-
Deferred income	-	1,267,503
Trade and other payables	263,993,776	217,569,462
Income received in advance	980,356,148	771,154,669
Unallocated receipts	16,327,617	2,827,793
	1,266,878,236	993,373,466
Total liabilities	1,299,447,316	994,474,803
	1,767,366,075	1,368,309,277
Total equity and liabilities	1,767,366,075	1,368,309,277

Annual Review 2018









HUMAN RESOURCE OVERVIEW

JOINT APPOINTMENTS



STAFF COMPLIMENT





Our Mission is to support the teaching, research and public health service Mission of the Faculty of Health Sciences

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VISION, MISSION & VALUES



Our vision.

Is to be a valued strategic partner of Faculty, recognised for the additional resources, commercial / business expertise and supplementary income we are able to make available to it.





Our mission.

Is to support the teaching, research and public health service mission of the Faculty of Health Sciences; either through the provision of commercial and administrative support for income-generating activities ancillaryto the main objectives of Faculty (namely teaching, research, and the provision of medical services), or by directly engaging in teaching, research, medical service or other related activities which are complementary to the main objectives of Faculty.

Our Values.

Stewardship - We recognize our role as stewards of the Faculty's assets by managing our resources responsibly, effectively, and efficiently.

Employees - We are committed to the success of our employees, as they are our most valuable resource, and so provide them opportunities for development, growth and personal success.

Respect - We are courteous, conscientious and respectful in our dealings with our customers, employees, Faculty and the communities where we work.

Variety - We embrace different viewpoints and support mutually beneficial partnerships among adiverse mix of individuals, departments, institutions, and community groups. We also embrace the wide and varied range of activities that we undertake in achieving our Vision and Mission.

Integrity - We conduct ourselves in a fair, ethical and honest manner. We strive to make all decisions in the best interests of our customers, employees, Faculty and the communities where we work. We are accountable and answerable for our actions.

Customer Service - We value innovative, timely, efficient, solution-oriented, and cost-effective services and systems. We are committed to achieving the highest levels of customer satisfaction achievable, given the resources at our disposal.

Entrepreneurship - We foster a culture where entrepreneurship and prudent risk taking are encouraged, where the entrepreneur is able to benefit as a partner in their venture.



Our Board of Directors include leading academics, business experts and specialist advisors.

Professor Martin Veller is the Non-Executive Director and Chairman of WHC Mr Alfred Farrell is the Executive Director and Chief Executive Officer

A skilled executive team oversees day-to-day operations of WHC and comprises of the following:

Mr Alf Farrell	Chief Executive Officer
Mrs Christine Grobler	Deputy Chief Operations Officer
Mr Daniel Mosia	Chief Strategic Officer
Mr Jean Du Randt	Chief Financial Officer
Mr Karl Basson	Chief Technology Officer (Speer Services)
Mr Mamatsabu Maphike	Chief Risk and Compliance Officer
Dr Ntsikelelo Itumeleng Funani	Chief Academic Officer
Mrs Robyn Hayes-Badenhorst	Head of the Office of the CEO
Mr Sagie Pillay	Chief Operations Officer





WHC has a highly-respected Board of Directors, selected for their internationally recognized academic excellence and management experience.

Responsible for overseeing all governance, internal controls, risk management, financial management and human resource services that WHC provides to its research units and to the University of the Witwatersrand.



Professor Martin Veller | MB BCh, FCS (SA), M Med (Surg) Non - Executive Director and Chairman

Professor Veller is Dean of the Faculty of Health Sciences at the University of the Witwatersrand and a Professor in the University's Deparment of Surgery. He is an expert in Vascular Surgery with extensive academic, research and teaching experience. Professor Veller also serves on the Board of Directors of the Wits Donald Gordon Medical Centre. He has trained at the University of Witwatersrand and at St. Mary's hospital at London's Imperial College



Mr Alfred Farrell | B Comm, B Compt (Honours), CA (SA) *CEO*

Mr Farrell is a skilled financial and accounting manager with many years of experience in senior financial management positions at companies such as the Automobile Association of South Africa, Interleisure and the Premier Group. Prior to joining WHC in 2002, Mr Farrell held the position of Chief Financial Officer for BDFM Publishers (Pty) Ltd.

Mr Farrell has steered Wits Health Consortium with invaluable insights gained through his successful career. Since joining Wits Health Consortium Mr Farrell has directed its portfolio of development and research programmes, managed through the Shared Service Centre, and has ensured the growth of Wits Health Consortium has been combined with high standards of delivery. Under Mr. Farrell's tenure the total income of Wits Health Consortium has grown from R150 million in 2002 to over R1.8billion in 2017.



Mr Desmond Arnold CA (SA), FCMA, AMP (Wharton)

Mr Arnold is a highly-skilled accountant and has held numerous financial positions in some of South Africa's leading corporates. He is a past President of the South African Institute of Chartered Accountants (SAICA) and was awarded honorary life membership in recognition of his services to the accounting profession. Mr Arnold is Chairman of the WHC Audit Committee and is also a member of the WHC Risk Committee. He is also a Trustee of the Absa Pension Fund.



Dr Rachel Chikwamba MBA, PhD (Genetics)

Dr Chikwamba is responsible for strategic alliances and communication and is an expert in scientific and industrial research. Her research has focused on metabolic engineering for nutrition and pharmaceutical applications. She has studied in the US and Australia and was an Honorary Research Fellow at St George's Hospital at the University of London. She has also taught post-graduate classes at the University of Pretoria.



Mr Prakash Desai B Comm, B Compt (Honours), CA (SA)

With many years of experience and skill in senior management roles, Mr Desai supports WHC in areas such as risk, audit, strategy and investment. He is currently Chief Executive Officer at Afrifocus Securities and worked as a former Group Chief Executive and Group Finance Director at Avusa. Prior to this, he was a Non-Executive Director at M-net Supersport Ltd and at Caxton Publishers and Printers Ltd.



Professor Daynia Ballot MB BCh, FCPaeds SA, PhD

Professor Ballot is a renowned pediatrician with a subspecialty in neonatology and an NRF C2 rated researcher and Head of the School of Clinical Medicine at the University of Witwatersrand.



Professor Johnny Mahlangu

MB BCh, M Med (Haem), FCPath (SA) (Haem) (Clin Haem)

Professor Mahlangu is Head of the University of the Witwatersrand's School of Pathology and Head of the Haematology Diagnostic Section in the Department of Molecular Medicine and Haematology. He has peer reviewed many journal publications and international congress presentations. He also sits on the editorial boards of various haemophilia treatment guideline committees and participates in multi-national clinical trials.



Dr Tshepo Motsepe MB BCh; MA (Public Health)

Dr Motsepe is a KwaZulu-Natal and Harvard University graduate. She has worked in private medical practice locally and abroad and has developed specialist knowledge in several fields, including family health, refugee health and HIV. She was Deputy Director of the Chris Hani Baragwanath Hospital in Johannesburg and Chairperson of the Health Accreditation Committee for the Gauteng Provincial Government.rs and Printers Ltd.



Associate Professor Maria Papathanasopoulos

Research and Postgraduate Affairs in the Faculty of Health Sciences

Professor Papathanasopoulos is an established scientist who has built an exceptional reputation in the infectious diseases, bioinformatics, and virology fields. She has established world class laboratories that con-duct innovative research on HIV-1 drug discovery, and vaccine designs that are recognised at a national, re-gional and international level. In the last eight years she has completed research for the South African Strategic Health Innovation Platform, the South African HIV/AIDS Research and Innovation Platform, the National Research Foundation, the International AIDS Vaccine Initiative Innovation Fund, the Carnegie Foundation, the Poliomyelitis Research Foundation and several others



Professor Helen Rees OBE, MB BChir, MA, MRCGP, DCH, DRCOG, MBA (Harvard)

Professor Rees is Executive Direc-tor of the Wits Reproductive Health and HIV Institute. Her specialist area focuses on HIV and Reproductive Health and she has published extensively in these fields. She has been internationally recognised for her expertise and for her contribution both nationally and internationally to research and medical advances in these areas.



Professor Zeblon Vilakazi PHD (Physics)

Professor Vilakazi is Deputy Vice-Chancellor of Research and Post-Graduate Affairs at the University of the Witwatersrand. His research interests include computational physics and heavy-ion collisions at high energies and his work saw him nominated as a Young Global Leader by the World Economic Forum in 2010. He is globally recognised for his ex-pert knowledge in physics and nuclear research.



Mr Mahomed Salim Ismail (Mac) Gani

CA (SA), B.Compt Honours

Mac Gani is an independent consultant with a distinguished career in accounting and financial management. He spent two years working in London for an auditing firm and has gained valuable experience locally working his way up to being a partner in a leading accounting firm as well as a financial executive leader. He has also developed a special interest in higher education and health services.



SUB-COMMITTEES

The following Sub-committees have been established to assist the Board to perform its duties.

- Audit and Risk Committee
- Remuneration Committee
- Academic Oversight Committee
- Social and Ethics Committee (Incorporating Sustainability Committee)
- Directors' Affairs Committee
- Strategy and Investment Committee





2018 Major Research Units







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PROFESSOR HELEN REES

Executive Director of the Wits Reproductive Health and HIV Institute

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WITS REPRODUCTIVE HEALTH AND HIV INSTITUTE

The Wits Reproductive Health and HIV Institute (Wits RHI) aims to tackle Africa's health challenges through science and innovation. It is acclaimed for its pioneering research, innovating services and providing evidence-based policy development and advocacy. Its areas of expertise cover HIV, Sexual and Reproductive Health and Vaccine Preventable Diseases.

Who We Are

The Wits Reproductive Health and HIV Institute (Wits RHI) is a leading African research institute that forms part of the University of the Witwatersrand's Faculty of Health Sciences. Wits RHI has a spread of activities, relevant to an African academic institution. WHRI are a hybrid organisation with one foot in research and the other offering technical and policy support to government and to global health institutions. While the core focal areas we work on are HIV, Sexual and Reproductive Health (SRH) and Vaccine Preventable Diseases, WHRI continuously adapting our emphasis for relevance, in existing focus areas and in exploring new areas of interface such as urbanisation, non-communicable diseases and climate change.

We use a multi-pronged approach to improve health outcomes at a national and global level, through research, technical assistance, advocacy, policy development, and health systems strengthening.

Wits RHI is a WHO Collaborating Centre, a UNAIDS and South African Medical Research Council (MRC) Collaborating Centre as well as a United Nations Population Fund (UNFPA) strategic partner.

2018 Project Highlights

Accelerating Program Achievements to Control the Epidemic (APACE) in Lejweleputswa District (Free State) and Strengthening HIV services in Tshwane, Gauteng Province

Wits RHI, USAID and the US CDC entered into partnerships that will result in accelerated efforts to control the HIV and TB epidemics in South Africa. Wits RHI will work closely with the Department of Health and other key stakeholders to support the City of Tshwane Metropolitan Municipality in Gauteng and the Lejweleputswa District in the Free State.

The goal of these programmes is to improve upon and expand comprehensive clinical and non-clinical differentiated HIV care and treatment services, that will accelerate and sustain HIV epidemic control in South Africa. The programmes will leverage key innovations to ensure a comprehensive package of services that meets the wide-ranging needs of different patient groups and is implemented across the HIV and TB continuum of care.

The ongoing support of the PEPFAR programme has already saved millions of lives across the African continent and in South Africa. We are very excited to be part of this new partnership programme with USAID and CDC. We believe that through this partnership, we will be able to achieve significant reductions in new HIV infections, HIV morbidity and mortality.

Key Populations Award

The Wits RHI Key Populations Programme was the successful recipient of a 5-year USAID Award for advancing the South African HIV Response for Key Populations, Sex Workers, and Transgender individuals. Sex workers and transgender individuals remain marginalised in public healthcare. This

award is changing the status quo for key populations in South Africa through increasing access to health care and enhancing the competency of health service providers to tailor responses to their needs. The award builds on the achievements of the Wits RHI Sex Worker Programme, which has rendered services to over 10, 000 sex workers over the last decade. We plan to expand our healthcare package to address more comprehensively the needs of sex workers in relation to mental health and substance abuse. We will diversify services at our sites and partner with other organisations, including those who work with the children of sex workers.

The opening of four dedicated transgender clinics in Eastern Cape (Port Elizabeth, East London), Western Cape (Cape Town) and Gauteng (Johannesburg) will be a first for South Africa, which has no identified network providing genderaffirming health care. We will work hand-in-hand with trans men and women to address gaps in service delivery and create health services that the community is comfortable using.

HPV Vaccine Impact Evaluation Project

Wits RHI was the successful recipient of two fiveyear awards from the Bill and Melinda Gates Foundation and the National Health and Medical Research Council of Australia. These grants will fund a study to evaluate the impact of 2-dose and 1-dose human papillomavirus vaccination schedules on community level HPV prevalence in South African adolescent girls. The current vaccine schedule requires 2 doses of vaccine administered 6 months apart. However, there are a number of barriers to the administration of the vaccines particularly for the second dose, and there is growing interest in the efficacy of a single dose of HPV vaccine schedule. The results of this study will have important implications for future programming; if a single dose is as effective as

two doses in preventing HPV infection this could translate into programmes that are easier to administer and improved vaccine coverage, cost savings and in the long-term improved prevention of cervical cancer and other HPV related cancers.

In February and March 2019, the research team will conduct an HPV vaccine catch up campaign using a single dose of HPV vaccine in a population of adolescent girls in Grade 10 in Lejweleputswa District of the Free State who would have been too old to receive the vaccine in 2014 when it was first introduced in schools. To evaluate the impact of the HPV vaccine in reducing HPV infection, the team will establish a network of eight sentinel surveillance sites. These will include five primary health care clinics in Lejweleputswa and three others in Gauteng, Mpumalanga and North West provinces. The team will conduct a series of HPV prevalence surveys in 2019, 2021 and 2023 in these clinics among women aged 17-18 years attending family planning services. Through these repeated surveys, the team will measure changes in the prevalence of HPV infection in age cohorts that were not eligible for vaccination compared to those that were and received either one or two doses of vaccine. The final study results are anticipated in first quarter of 2024.

Evaluating innovative strategies to reduce HIV infection and gender based violence among adolescent girls and young women School Based HIV and GBV Prevention Programme

Wits RHI was the successful recipient of the USAID School Gender Based Violence (GBV) Programme which aims to reduce the incidence of HIV infection and violence among in-school adolescent girls and boys. The technical approach utilizes the socio-ecological model (as implemented within the school environment) with a focus on female and male learners between 9-19 years attending all primary and secondary schools in prioritized education districts, as well as educators, parents, school management teams (SMTs), and health facilities to ensure linkage to care and quality, youth friendly health service provision for adolescents.

This strategy will be complemented by layering upon the work of NGO partners supporting district HIV programmes through PEPFAR grants. The model involves a multilevel and multi-sectoral programme underpinned by enhanced Monitoring and Evaluation as well as adaptive programming. Achieved through a layering of interventions at the district level, and enhancing and leveraging the She Conquers platform (i.e. organizations working in unison to ensure comprehensive coverage of interventions).

This approach is more likely to sustain prevention efforts over time than any single intervention. The interventions will be multi-level and will target individuals as well as trying to influence the context in which they live and study. There is a focus on increasing safe schools and access to youth friendly health services and psychosocial support including post violence, whilst at the same time engaging and educating key influencers such as heads of departments, life orientation specialists, educators and parents.

Project PrEP: Integrating PrEP into Comprehensive Services for Adolescent Girls and Young Women (AGYW)

To address the HIV prevention needs of Adolescent Girls and Young Women (AGYW), the National Department of Health, in coordination with the Department of Basic Education and the Department of Social Development, are implementing the She Conquers national campaign that aims to:

reduce new HIV infections among adolescent girls and young women; reduce the incidence of teenage pregnancies; increase retention of girl learners in school until matric; reduce sexual and gender based violence experienced by adolescent girls and young women and increase economic opportunities for young people increase retention of girl learners in school until matric; reduce sexual and gender-based violence experienced by adolescent girls and young women and increase economic opportunities for young people.

Project PrEP will run from 2018 to 2020. The primary goal of the project is to contribute to a decrease in the incidence of HIV among AGYW (age 15-24) in South Africa. The project aims to strengthen demand, uptake and retention for comprehensive HIV prevention services including PrEP. This project will also help to fill a gap in the global evidence base on the appropriate and most effective models for PrEP delivery, in the context of comprehensive health services (SRHR, combination prevention) to AGYW.

To achieve this objective, the project will integrate the provision of PrEP into the 'She Conquers' programme, focusing on effective coordination and collaboration across the different channels of provision (households/community structures, schools, technical and vocational education training institutions, public health facilities, and outreach services) informed by mapping of partners and services in the selected sub-districts.

EMPOWER Study

The EMPOWER study, which enrolled 431 sexually active adolescent girls and young women (AGYW) in inner-city Johannesburg, South Africa and Mwanza, Tanzania, was designed to address the heightened vulnerability of AGYW to HIV and violence in these two countries. The study offered a package of scalable HIV prevention interventions including daily oral PrEP and evaluated the feasibility and acceptability of integrated screening and linkageto-care for AGYW who had experienced lifetime GBV and stigma – a novel intervention in the context of PrEP delivery.

Participants were also randomised to attend monthly adherence clubs that followed an empowerment curriculum intervention in the context of PrEP delivery.

The study found that lifetime experience of GBV (physical, sexual, or psychological violence) was high, experienced by around one third of the young women screened at enrolment, yet very few had ever been asked about GBV by a health provider before. Both AGYW and healthcare providers interviewed found the GBV screening offered by EMPOWER feasible and acceptable. PrEP acceptance was very high (between 94% and 100% of enrolled participants), which exceeded our expectations and reflects the huge interest in alternative female-controlled HIV prevention methods in this at-risk population.By month 6 of the study, 60% of participants were still using PrEP. Qualitative interviewing found that these women were motivated to continue by an accurate awareness of their HIV risk and a desire to take control of their health. While club attendance was low overall, participants who did attend club sessions valued them highly as non-judgmental spaces where they could learn strategies to deal with conflict and assert their rights within sexual relationships.

Self-Testing Africa Initiative (STAR)

The STAR HIV Self-screening - Initiative Africa, funded by UNITAID, uses evidence -based interventions drawn from the experience from Wits RHI and from others programmes, enabling individuals to learn their HIV status when and where they choose. The aim is to increase HIV testing, thereby increasing the numbers of people who know their HIV status and have access to care and treatment. HIV Self-screening (HIVSS), which allows individuals to screen themselves in the privacy of their own homes by themselves or with their partner, has proven a critical tool to increase the adoption of both HIV prevention and treatment services. In 2018, close to 600 000 HIV Self-Tests were distributed through the Wits RHI STAR programme, reaching key and under-tested population.

The programme which focuses on these populations has tested 65% males, 40% of whom had not tested for HIV previously, or within the last year. Various distribution models have been set up for evaluation which include community, facilities, taxi ranks, pharmacies, workplaces and others. This project is paving the way forward for investment by the Department of Health into HIV Self Screening by providing the required evidence.

ADVANCE Study

Advance was designed to generate evidence to replace the current standard of care first-line HIV treatment (TDF/EFV/FTC or 3TC) with a fixed-dose, DTG/TAF-based regimen in low and middle-income countries (LMIC). DTG and TAF have demonstrated increased robustness, and safety, in addition to better patient tolerability and reduced costs.

A switch to a DTG/TAF-based regimen could enable South Africa to treat everyone by 2019 with its current ART budget, suggesting the power of this regimen to enable low- and middle-income countries to meet the increasing treatment demands under "treat all" and to achieve the 90-90-90 targets.

Enrolment for the study was completed in May 2018. This study will provide critical data for the use of DTG and TAF in an African population – the largest study outside of a European or North American cohort.

ECHO Study

In 2016, the Evidence for Contraceptive options and HIV Outcomes (ECHO) Study was launched in four African countries, namely Kenya, South Africa, Swaziland and Zambia. The study is being led by an international consortium consisting of Wits RHI, the University of Washington, FHI360, the Kenyan Medical Research Institute, and WHO. The primary objective of the ECHO study is to evaluate whether there is any difference in the risk of acquiring HIV infection among users of three highly effective, reversible methods of contraception.

In this study women were randomized to either the depo-provera injection, the Jadelle implant or the copper IUD. In 2018, the ECHO study reached its recruitment target of 7800 women and results will be published in 2019. In addition to HIV incidence, the study will document pregnancy rates, method switching and side effects of the three methods. The study is widely regarded as one of the most important SRH/HIV studies to be undertaken and active planning is underway in anticipation of the different scenarios that might result from the study.

Maternal Immunisation – RSV-M-301

The Shandukani Research team has been actively involved in the RSV-M-301 study which was initiated to establish the establish efficacy of the aluminum-adsorbed Respiratory Syncytial Virus (RSV) - RSV F vaccine in providing protection against RSV disease in infants during the first three months of life via active immunization of pregnant women in the third trimester of pregnancy. Pneumonia stubbornly remains the leading killer of children under the age of five worldwide. The study showed that the new maternal vaccine from Novavax shows promise in the fight against RSV, the most common cause of viral pneumonia in young children. Although the study did not meet the prespecified success criterion for the primary clinical endpoint of this trial, the data indicate that ResVax protects infants from some of the most serious consequences of RSV, including RSV LRTI hospitalizations and RSV LRTI with severe hypoxemia. The potential to prevent these most serious outcomes during infants' most vulnerable months of life could have a profound impact upon the global burden of RSV disease.

African Local Initiative for Vaccinology Expertise (ALIVE)

Professors Helen Rees (Wits Reproductive Health and HIV Institute - Wits RHI) and Shabir Madhi (Respiratory and Meningeal Pathogens Research Unit - RMPRU) spearheaded and co-ordinated the development of the 'African Leadership in Vaccinology Expertise' (ALIVE) application, which was submitted to the University of the Witwatersrand (Wits) in 2015 as a contender for the University's Flagship research program initiative. This initiative was proposed and supported by the South African National Research Foundation (NRF) to support the establishment of one interdisciplinary research entity based on outstanding existing research strengths.

ALIVE was selected by Wits as its Flagship research program in 2016. World-class institutions and academics from Wits university, including the National Institute of Communicable Diseases, CoE- for Biomedical TB Research, PRICELESS, Wits School of Molecular and Cell Biology, Hepatitis Virus Diversity Research Unit, Perinatal HIV Research Unit HIV Pathogenesis Research Unit and the Sydney Brenner Institute, are members of the ALIVE consortium. Professors Rees and Madhi are co-directors and Dr Clare Cutland is the Scientific coordinator of ALIVE. The main aims of ALIVE are to inspire innovation in this important field of vaccinology research spanning basic and clinical sciences, implementation science and public health expertise.

Income and sustainability

Wits RHI is a donor-funded organisation and in 2018 the Institute had more than 74 grants under management, totalling over R652 million per annum. Funding is sourced both internationally and locally, and includes substantive grants from the Department of Health, National Institutes of Health, Bill & Melinda Gates Foundation, European Union, the World Health Organization (WHO), United States Agency for International Development (USAID), Unitaid and the President's Emergency Plan for AIDS Relief (PEPFAR).

Publications

In 2018, Wits RHI has 36 staff who were jointly appointed in the Faculty of Health Sciences, with 25 staff who are at researcher level or above and are considered research-active. Wits RHI staff published a total of 141 manuscripts in ISI-indexed journals. 40% of the total manuscripts had a Wits RHI staff member as the first author, 51 manuscripts had a Wits RHI staff member as the first author, 51 manuscripts had a Wits RHI staff member as the last author and 51 manuscripts were published in journals with an IF≥3. 86 abstracts were accepted for presentation as oral or poster presentations at international and national conferences. Wits RHI has a growing postgraduate support programme with 12 registered PhD students affiliated to it.

Awards

Wits RHI staff received several accolades including Professor Helen Rees, Dr Lee Fairlie and Dr Thesla Palanee-Philips who received University of the Witwatersrand's Faculty of Health Sciences Award in Recognition of Dedication and Achievement in Research. Letitia Greener received the Special Achiever Award from the Faculty of Health Sciences.







PROFESSOR NEIL MARTINSON Executive Director of the Wits Perinatal HIV Research Unit

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PERINATAL HIV RESEARCH INSTITUTE

The Perinatal HIV Research Unit (PHRU) research vision is: Improving Life Through Research. PHRU's research spans HIV and TB prevention and treatment, and has an emerging emphasis on non-communicable diseases.

Who We Are

PHRU is a clinical research unit with capacity to conduct complex observational studies and individual randomized trials of new treatments and vaccines in adults and children. We also have extensive experience in conducting implemenation science at the clinic or household level using cluster trial methodology.

Our head office is at Chris Hani Baragwanath Academic Hospital but have satellite research sites in Kliptown, Matlosana (Klerksdorp), Botshabelo (Free State) and in Limpopo. We collaborate extensively with local and international investigators.

Research in 2018 :

PHRU researchers were authors of 62 publications in international, peer- reviewed journals and gave multiple talks at international conferences and symposia. Researchers at PHRU were awarded several new, large, competitive, research grants and continued to apply for others. Shortly after obtaining her PhD, Dr Jenny Coetzee was awarded a grant through the MRC to conduct nationwide surveillance of HIV prevalence in sex workers.

Dr Kennedy Otwombe, PHRU's senior statistician successfully applied for a CARTA grant assessing whether pooling TB specimens from a single household is a valid way of identifying TB in contacts of index TB cases. Professor Martinson was awarded a Bill and Melinda Gates Foundation grant to assess the impact of a targeted universal testing for TB (TUTT) strategy in 60 primary care clinics. He also received a multi-year research grant from Pfizer to follow up adult patients to assess incidence of recurrence in those admitted to hospital with pneumonia. Dr Janan Dietrich with others at PHRU, and with collaborators in the UK and Uganda, successfully applied for an EDCTP grant to inform the roll-out of PreP in adolescent men.

This innovative grant includes qualitiative research and will also use an ex vivo model of HIV infection of foreskin tissue to inform optimal dose and duration of protection of PrEP in young men.

Ms Minja Milovanovic received funding from the Wits Research Office to study prevalence of TB and explore contextual issues relating to delayed or non-attendance at health facilities of adults who died at home from natural causes. Dr Limakatso Lebina will be assessing the prevalence of non-communicable diseases (NCDs) in older HIVinfected adults suppressed on ART in Limpopo and is completing her PhD assessing the fidelity of clinics to implementation of national care guidelines for NCDs.

Our key founders:

The US Government's National Institutes of Health (NIH) is our key research funder, providing support for both the PHRU's Division of AIDS (DAIDS) Clinical Trials Network Clinical Trials Unit (CTU) and large collaborative trials funded through the R01 mechanism.The PHRU's Karabelo CTU now manages multiple clinical research sites (CRS): two in Klerksdorp, one in Rustenburg and the remainder in Soweto.

In addition to numerous investigator- driven and publicly-funded clinical trials, PHRU also conducts clinical trials for pharma. In 2017, PHRU continued to participate in Community Advisory Boards (CABs), established new partnerships, and grew CAB membership at Soweto and Matlosana in the North West province.

Mentorships in 2018:

In 2017 we actively supported both undergraduate and post graduate emerging researchers. PHRU hosted or supervised: several PhD candidates, multiple masters students, and 7 National Reseach Foundation Interns (mmm moo whom are now employed at PHRU). We continue to host international undergraduate and post-graduate students, from Harvard, Johns Hopkins University and elsewhere.

Staffing in 2018:

In 2017 PHRU remained a growing research unit with 410 employees on staff.











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CLINICAL HIV RESEARCH UNIT & THE HEALTH ECONOMICS AND EPIDEMIOLOGY RESEARCH OFFICE

The Wits Clinical HIV Research Unit (CHRU) and the Health Economics and Epidemiology Research Office (HE²RO) aim to deliver excellence and quality clinical epidemiological and healtheconomics research, services and support. CHRU is based in Johannesburg at the Helen Joseph Hospital and HE2RO's headquarters are in Parktown, Johannesburg.

CHRU Satellite sites operate at the Sizwe Hospital in Sandringham in Johannesburg and in Durban at the King Dinuzulu Hospital Complex and the HE²RO satellite sites are based in Gyani and Tzaneen.

Who We Are

The Clinical HIV Research Unit (CHRU) and Health Economics Research Office (HE²RO) is part of the University of the Witswatersrand's Faculty of Health Sciences.

As internationally recognised research and technical assistance units, CHRU and HE²Ro delivers clinical, epidemiologic and health economic research services. The ubits also ensures that research information is invested at operational level for the prevention, treatment and management of HIV and associated diseases.



Clinical Trials Units for NIAID Networks (UM1)

The major goals of this project is that the HIV/ AIDS Clinical Trials Networks and their CTU/CRS will pursue clinical trials to address the highest priorities in HIV/AIDS research, including: 1) Adult HIV therapeutic strategies, including HIV cure, noninfectious comorbidities, and the infectious comorbidities of hepatitis and tuberculosis; 2) strategies to address HIV and HIV-associated infections in pediatric and maternal populations; 3) integrated HIV prevention strategies; 4) microbicide strategies to prevent HIV infections; 5) vaccines to prevent HIV infections; and 6) strategies to address antibacterial resistance.

ACTG LEADERSHIP

The major goal of this project is for the ACTG Leadership to oversee the overall administrative, scientific, and laboratory management of the ACTG and provides guidance to and coordinates the activities of the Leadership and Operations Center, the Network Coordinating Center, and the Statistical and Data Management Center.

RTC/USAID (AID-674-A-12-00020)

The main objective of the Sub-Award is to provide technical assistance to the South African Department of Health through targeted expert support to: Ensue support of the UNAID'S 90/90/90 strategy to end the AID'S epidemic. By 2020, 90% of all people living with HIV will know their HIV status. By 2020, 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy. By 2020, 90% of all people receiving antiretroviral therapy will have viral suppression.

ZeNIX-TB/NC007

(Sizwe & Durban Site)

A Phase 3 partially-blinded, randomized trial assessing the safety and efficacy of various doses and treatment durations of linezolid plus bedaquiline and pretomanid in participants with pulmonary infection of either extensively drug-resistant tuberculosis (XDRTB), pre-XDR-TB or treatment intolerant or non-responsive multidrug resistant tuberculosis (MDR-TB).

TB SEQUEL

(Hoelscher, Michael) BMBF/EDCTP

Pathogenesis and Risk Factors of long-term sequelae defining the individual Outcome and Public Health Impact of TB Disease. This study aims to advance the understanding of the clinical, microbiologic, and host immune factors affecting or predicting the long-term sequelae and socio-economic impact of pulmonary tuberculosis and treatment outcome; identify the most important factors that contribute to lung impairment, including the immunological response and genetic predisposition of the host and differences in the biology of the pathogen; and facilitate novel interventions to restore and preserve overall health and well-being in patients with TB.

PanACEA II (Boeree, Martin) EDCTP

PanACEA II - a drug development program to shorten and simplify treatment of drug sensitive tuberculosis (pending). The aim of the project is to complete the optimisation of existing drugs and to evaluate two new novel agents. To go further by testing combinations regimens that will shorten and simplify treatment for both drug-sensitive and drug-resistant tuberculosis. Trials will be conducted at 11 sites throughout sub-Saharan Africa, empowering African scientists in all aspects of an integrated and comprehensive programme for drug development. Expand the capacity development programme to strengthen African clinical trial sites and research capacity and to strengthen and transfer African scientific leadership.

Protocol: 20130286

AMGEN

"A Double Blind, Randomized, Placebo Controlled, Multicenter Study to Evaluate Safety, Tolerability, and Efficacy on LDL-C of Evolocumab (AMG 145) in Subjects with HIV and with Hyperlipidemia and/or Mixed Dyslipidemia".

The aim of the study is to evaluate the effect of 24 weeks of subcutaneous (SC) evolocumab administered every month (QM) compared with placebo QM on percent change from baseline in low-density lipoprotein cholesterol (LDL-C) in human immunodeficiency virus (HIV)-positive subjects with hyperlipidemia or mixed dyslipidemia.

D2EFT

(Dr Richard Kaplan) UNSW Australia /Kirby Institute

"Dolutegravir and Darunavir Evaluation in adults Failing Therapy / A phase IIIB/IV randomised openlabel trial to compare dolutegravir + pharmaco-enhanced darunavir versus recommended standard of care antiretroviral regimens in patients with HIV infection who have failed recommended first line therapy".

The primary objective is to compare the virological efficacy of the two regimens in the intention to treat (ITT) population. Virological efficacy is defined as the proportion of participants with plasma HIV RNA (pVL) <50 copies/mL at 48 weeks. placebo QM on percent change from baseline in low-density lipoprotein cholesterol (LDL-C) in human immunodeficiency virus (HIV)-positive subjects with hyperlipidemia or mixed dyslipidemia.

MRC SA (Dr Glenda Gray) MRC SA

Fast-tracking rifampicin-resistant patients into care using line list alerts (FAST LINK)

The aim of the study is to assess the impact of a centrally coordinated laboratory alert system and tracing plan on early indicators of treatment initiation in patients with DR-TB detected through Xpert testing in primary healthcare clinics in Nelson Mandela Bay (NMB).

STREAM II

(Nunn, A) USAID / IUATLD

Protocol #ISRCTN 78372190 "The Evaluation of a Standardized Treatment Regimen of Anti-Tuberculosis Drugs for Patients with MDR-TB" The major aim of this study is to assess whether the proportion of patients with a favourable efficacy outcome on the study regimen is not inferior to that on the control (WHO approved MDR-TB) regimen, and to compare the proportion of patients who experience grade 3 or greater adverse events, during treatment and follow-up, in the study regimen as compared to the control regimen.

NIX-TB

TB ALLIANCE (CHRU Sizwe & King Dinuzulu Sites)

A Phase 3 randomized, open-label trial assessing the safety and efficacy of bedaquiline plus PA-824 plus linezolid in Subjects with pulmonary infection of either extensively drug-resistant tuberculosis (XDR-TB), or treatment intolerant / non-responsive multi-drug resistant tuberculosis (MDR-TB).

2U01CA121947

(Susan E Krown) AMC/EMMES

AMC is a National Cancer Institute-supported clinical trials group who support innovative trials for AIDS-related cancers. They deal with the cancers that affect HIV-positive patients—Kaposi's Sarcoma, Lymphoma, Human Papillomavirus-related Cancers (for example, anal and cervical cancers), and Non-AIDS Defining Cancers (for example, lung cancer, head and neck cancer, liver cancer). In addition, the AMC are working to expand the AMC globally and to conduct clinical trials for AIDS-related cancers in diverse patient populations.

GLOBAL CAB

(Stephanie Siedel) TB ALLIANCE

The objective of this research is to engage trial participants and their communities and/or community advisory structures create a bridge between researchers and the community to 1) obtain community input into trial implementation; 2) understand community perceptions and concerns and address them in the research process; and 3) facilitate smooth implementation of clinical programs.

MERCH HPV

(C Firnhaber) MSD

A randomized, placebo-controlled trial of pretreatment HPV vaccination on outcomes to LEEP treatment of cervical high grade squamous intraepithelial lesions in HIV-infected women.

The Union/Vital Strategies (Russen, I)

Vital Strategies

The Clinical Research Advisor will work under the

guidance of the Senior Vice President for Research and Development at the Union North America. In addition to oversee coordination of and submit regular reports regarding community engagement activities for sites located in Africa.

HDT TB (Wallis, Robert) BMGF

HDT TB: HOST-DIRECTED THERAPIES FOR TUBER-CULOSIS.

The aim of the Project is to examine if adding hostdirected therapy to standard antimicrobial treatment could result in a shorter and improved treatment of TB.

5U01HL123336

(Grinspoon, Steven)

REPRIEVE "A5332: Randomized Trial to Prevent Vascular Events in HIV". The aim of the study is to determine the effects of pitavastatin as a primary prevention strategy for major adverse cardiovascular events (MACE) in HIV. The aim of the Project is to examine if adding host-directed therapy to standard antimicrobial treatment could result in a shorter and improved treatment of TB.

New Research Initiatives in 2018 – CHRU

- 1. BEAT TB 7206741CA00006
- 2. Building Evidence for Advancing new Treatment for pre-XDR/XDR-TB (BEAT- TB) BEAT TB aims to address the South African NSP goal to investigate an effective treatment regimen for Drug Resistant TB (DR TB). The clinical trial proposed in BEAT TB will investigate the safety; tolerability and efficacy of an oral shorter regimen for DR TB. In addition, the BEAT TB activity will strengthen the DR TB research capacity in South Africa.

- **3. TB PRACTICAL** (Bern-Thomas Nyang'wa) Pending Medecins Sans Frontieres, Netherlands Pragmatic Clinical Trial for a More Effective Concise and Less Toxic MDR-TB Treatment Regimen(s) (TB-PRACTECAL) The major goal of this project is to evaluating short treatment regimens containing bedaquiline and pretomanid in combination with existing and repurposed anti-TB drugs for the treatment of biologically confirmed pulmonary multi drugresistant TB (MDR-TB).
- 4. NC008/SimpliciTB (Morounfolu Olugbosi) Global Alliance for TB Drug Development "Trial to Evaluate the Efficacy, Safety and Tolerability of BPaMZ in Drug-Sensitive (DS-TB) Adult Patients and Drug-Resistant (DR-TB) Adult Patients". To evaluate the efficacy, safety and tolerability at 8 weeks (2-months), 52 weeks (12-months), and 104 Weeks (24-months) post the start of the following treatment regimens in participants with: Drug Sensitive TB (DS-TB) patients given BPaMZ for 17 Weeks (or 4 months) vs. Standard HRZE/HR treatment given for 26 weeks (or 6 months) and Drug Resistant TB (DR-TB) patients given BPaMZ for 26 Weeks (or 6 months).

HE2RO Highlights for 2018

HE²RO continued to grow its projects in 2018 in South Africa and neighbouring countries. By the end of the year, HE²RO had 12 grants for research projects and associated studies underway. Highlights of the year included:

INROADS (Innovations Research on HIV/ AIDS) – final year and close out: On the 31 December 2018 INROADS (Innovations Research on HIV/AIDS), a six year co-operative agreement with USAID-South Africa, closed. The successful completion of this award marks a huge milestone for HE²RO as it was its first USAID award as a prime recipient. This award has supported and sustained a collaboration between the University of Witwatersrand (Wits Health Consortium) and the Boston University's Department of Global Health which has, and continues to, facilitate the development of local public health research capacity, in particular in the areas of health economics and epidemiology. It also allowed HE²RO to partner with the Centre for Economic Governance and Accountability in Africa (CEGAA) to support the budget and finance functions related to the public sector HIV service provision in South Africa. Through the activities and output generated from this co-operative agreement technical assistance has been provided to the National Department of Health, National Health Laboratory Services and the National Treasury, as well as other key stakeholders. The final report for this award is still being completed, but to date the award supported the generation of more than 120 peer reviewed publications, more than 50 policy materials and the training of more than 300 researchers and stakeholders. Some research highlights from IN-ROADS include:

The 'Ten years on' study: The cohort analysis for this study included clinical records for 6644 HIV positive adults initiating first-line ART between April 2004 and March 2007 and 24 in-depth interviews with selected patients. This allowed us to explore predictors of attrition as well as treatment programme experiences of those patients who had been at least 10 years on ART. While almost 80% of the cohort were alive in care at 12 months after initiation this dropped to 35% over ten years. Year and age at ART initiation, sex, nationality, baseline CD4 count, anaemia, BMI and initiating regimen were all predictors of 10 year attrition. Among those patients interviewed the clinic environment, feelings of gratitude, support networks and self-efficacy all facilitated linkage to treatment and adherence; side effects, travel and a decline in facility capacity and conditions were barriers to treatment and adherence. These barriers present a significant challenge to long-term retention as more people become eligible for ART in the context of "treatment for all" meaning that interventions are needed to ensure continued long-term programme successes. A manuscript describing these results has been published in the Journal of the International AIDS Society (JIAS).

CHoiCE: The CHoiCE study used a discrete choice experiment design to explore the preferences of high-school learners for HIV and contraceptive services. Four-hundred and two learners were enrolled from three secondary schools in Gauteng and preliminary analysis of both the qualitative and quantitative DCE study have been completed. These early results showed that above everything the provision of private and confidential services by compassionate and understanding healthcare providers is key for ensuring adolescent uptake of HIV and contraceptive services. This study will now be expanded to look at how preferences might differ among leaners in higher wealth-quintile schools, and among younger learners and learners in other provinces.

PrEP: HE2RO staff also worked alongside the NDOH PrEP working group to advise on the most cost-effective roll-out strategies for PrEP, as well as the budget needed to reach the PrEP targets contained in the National Strategic Plan and beyond. Lise Jamieson and Dr Gesine Meyer-Rath, using HE2RO's own bottom-up cost estimates and the Thembisa model, a model of the South African HIV epidemic, found that PrEP provision would be most cost effective to female adolescents (15-19) at high risk of HIV infection, followed by female sex workers, young women (20-24) at high risk, and MSM, and could be cost saving over 20 years when given to these populations.

HE2RO staff included the shift from the current fixed-dose regimen for first-line adult antiretroviral treatment (tenofovir, emtricitabine and efavirenz, or TEE) to one containing dolutegravir (TLD) in their long-standing model of the cost of ART in South Africa and into Thembisa. They found that TLD would be 36% cheaper than TEE per patient on first line and could reduce the total cost of the HIV programme by 10%, through a combined combination of cheaper drug costs, less need for second line ART (based on zero treatment failure under TLD), and a reduction in new infections of 11%, all over 20 years. Cost savings would be smaller if TLD was given to men only, but would remain even if all women on TLD were additionally offered contraception to minimise the risk of teratogenicity.

SN-METRIC: This project (social networks and molecular epidemiology of TB transmission clusters) aims to combine molecular sequencing analysis with social network analysis and geospatial mapping to provide insights into the relationships between DR-TB subjects with matching strain genotypes ("clusters") and the locations where TB transmission may be occurring. To date, 92 patients have been enrolled at Charlotte Maxeke Johannesburg Academic Hospital, Helen Joseph Hospital and South Rand Hospital.

Participants have undergone a full social network interview as well as a mapping exercise to geo-code the locations they commonly frequent. HE2RO is working with the National Institute of Communicable Diseases (NICD) on the genomic sequencing component of the study. Dr Rebecca Berhanu, PI of this study, was the recipient of a UJMR Fogarty Global Health fellowship in 2018.

SLATE: 2018 saw the completion of patient follow up under the SLATE I study as well as the submission of a manuscript describing the primary outcomes of the study for peer-review at PLoS Medicine. The results from SLATE I offered insights into how to manage patients presenting with TB symptoms who are otherwise eligible for sameday initiation of ART and as a result, the SLATE II study commenced early in 2018. SLATE II, like its predecessor SLATE I, evaluates a simplified clinical algorithm for same-day ART initiation that can be implemented in nurse-managed settings without laboratory test results. Enrolment of 593 study subjects has been completed and patient follow up is underway.

HIV Self Testing: In 2018, HE2RO researchers started a new collaboration with the STAR Consortium, LSHTM and Wits RHI to analyse the cost and impact of different distribution methods for HIV self-tests (HIVST). The UNITAID-funded consortium has successfully piloted HIVST distribution in Malawi, Zambia and Zimbabwe and is now focussing on South Africa, Eswatini and Lesotho. In South Africa, 1.2 million self test kits are being distributed through community channels (including transport hubs such as taxi ranks), workplaces, facilities and key population programmes. Under a separate grant from the Bill and Melinda Gates Foundation, HE2RO senior researcher Dr Gesine Meyer-Rath and Wits RHI health economist Cyprian Mostert are collecting cost data, including timeand-motion data, from each distribution channels. They will then model the cost and cost-effectiveness of each channel in order to be able to advise government on which channels to implement as part of a national self-testing strategy.

HIV self-testing (HIVST) economic evaluations: Funded through the EQUIP mechanism, economic evaluations were conducted of three different HIVST trials in two different countries: facility-based HIVST in Malawi, index HIVST in Malawi, and adolescent community-based self-testing in Zambia. We found implementing facility-based HIVST may result in a large increase in number of newly diagnosed individuals at a modest additional cost; that patient linking strategies need to be improved to make index-HIVST an economically viable option; and that a service to escort adolescents from the HIVST site to a healthcare facility is more cost-effective than providing self-referral slips alone. Parts of this work have been published in Trials in 2018, and three additional manuscripts have been submitted. Parts of this work have been presented as poster presentations at AIDS 2018 in Amsterdam, and will be presented as two additional posters at CROI 2019 in Seattle.

ENHANCE: Data collection and analysis for the evaluation of the National Adherence Guidelines for Chronic Diseases in South Africa has now been completed. We enrolled, through passive data collection, a total of 7943 patients into five cohorts of patients to evaluate the impact of five interventions for patients on HIV treatment (adherence clubs, fast track initiation counselling, decentralized medication delivery, enhanced adherence counselling and early tracing of patients lost to follow up). Our early results showed benefits to adherence clubs (in terms of increased medication pickups over 3 months) and fast track initiation (in terms of increased initiation). Our long term outcomes have now shown retention and suppression benefits (or at a minimum comparable outcomes) for adherence clubs and decentralized medication delivery. Early benefits for fast track initiation counselling did not translate into increased suppression and retention.

We saw no benefit to enhanced adherence counselling or early tracing. Reports on the early and long term outcomes as well as qualitative work documenting patient and provider perspectives on differentiated care models are available on the World Bank publication repository. The protocol for the evaluation has been published in BMI Open and the outcomes of enhanced adherence counselling and tracing have been published in Tropical Medicine and International Health. Early outcomes results for all interventions were presented as posters at CROI in Boston, USA and a poster presenting the lessons learned from early implementation of these guidelines was presented at the AIDS 2018 conference in Amsterdam, Netherlands. A manuscript describing fast track initiation counselling and a second manuscript describing the results from adherence clubs and decentralised medication delivery are currently under review at different journals.

Geospatial model created for sample transport optimization in Zambia: A geospatial model was finalized to create an efficient sample transportation network in Zambia in order to assist government and partners scale up the Zambian viral load program. The analysis demonstrated that an efficient sample transport network that optimizes sample transport on the basis of geography and test volume, rather than political boundaries, can cut the cost of sample transport by more than half, and was published in JIAS in 2018. This work was expanded to determine the cost to reach 100% viral load access, and creating methodologies to optimize point of care instrument placement for improving viral load access and minimizing costs.

This expanded work was presented as two oral presentations at AIDS 2018 in Amsterdam, and has laid groundwork for a similar analysis of sample transport optimization in South Africa.

Integrating a package of home-based early childhood interventions into existing community health worker protocols in South Africa: A cluster-randomized trial: The goal of this project is to evaluate the impact and scalability of an innovative package of home-based interventions designed to improve early childhood health and development. The project, funded by the SA-MRC and Gates Foundation – Grand Challenges South Africa: All Children Thriving program, enrolled over 500 community healthcare workers (CHW) and over 1,000 caregiver/child pairs from Greater Tzaneen and Greater Giyani, Limpopo Province. On average 65%, and in some areas as much as 80%, of CHWs in the intervention arm have returned for the second and third round of training. The team is currently busy monitoring the implementation of intervention as this will help us better understand issues pertaining to fidelity and quality of implementation.

Neurocognitive assessment in Limpopo:

HE²RO together with investigators from Boston University and the University of Tampere embarked on a new study in Limpopo Province to assess neurocognitive development in young children using electroencephalography (EEG) and eye-tracking. The purpose of the study is to better understand the development of children's thinking and learning. The neurocognitive study is a sub-study of the larger intervention study and is also funded by the SA-MRC and Gates Foundation – Grand Challenges South Africa: All Children Thriving program. In November 2018 we completed the first round of assessments when children were 7 months old. We enrolled over 310 infants (65% of the target sample) in Greater Tzaneen; however the quality of assessment data is higher than was anticipated and we will have usable observations from more than 250 children.

Caregivers and their children will be invited to come back for two additional rounds of EEG and eye-tracking assessments when the child reaches 16 and 24 months of age.

Other Highlights:

- HE²RO has been selected as an international training site for the HBNU Fogarty Global Health Training Program. The Program brings together leading academic research institutions with long standing relationships in LMICs through out Africa and Asia in a variety of disciplines and with multidisciplinary research capacities.
- Prof Gesine Meyer-Rath and Craig van Rensburg have been part of the World Health Organization's Cost-Effectiveness of HIV Testing Services Technical working group (CENTS) since March 2018. The webinar series resulted in a very well-attended seminar on costing methods for national HIV testing programmes during the AIDS 2018 conference in Amsterdam.
- HE²RO registered on the TB Think Tank consultant database for Health Economics Evaluation and Statistical analysis.
- Denise Evans received NRF C2 rating. Denise Evans continues to represent the large Wits Health Consortium research entities on the Faculty of Health Sciences Research Committee (FRC).
- Member on the National TB Think Tank and Optimizing TB Treatment Outcomes working group.

HE²RO published 38 journal articles in 2018.

The total income for HE2RO exceded sixty million rand from over 12 research projects.







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WITS MATERNAL, ADOLESCENT AND CHILD HEALTH SYSTEMS

The Wits Maternal, Adolescent and Child Health (MatCH) division iscommitted to supporting the implementation of sustainable publicsector health services, with a focus on maternal, adolescent and child health; and HIV and TB prevention, treatment, care and support.

Who We Are

1

Maternal, Adolescent and Child Health (MatCH) is a South African donor-funded organization based in Durban in KwaZulu-Natal. We are a division of the Wits Health Consortium, affiliated to the School of Public Health.

MatCH has extensive experience in public health, primary health care and large- scale health service delivery in resource- constrained, high burden areas and has been recognized globally for our ability to provide large scale ART services in low cost and low technology environments, while delivering quality services and building health systems capacity.

MatCH has developed a variety of innovative approaches to scale up HIV and TB prevention, treatment and care and has a strong track record of making a significant impact in mitigating the epidemic.



Where we operate:

MatCH has a long history of working in Kwa-Zulu-Natal to support public sector HIV, TB, Maternal, Child and Women's Health programme delivery. In addition to our head office operations in Durban, South Africa, MatCH has satellite offices in Pietermaritzburg and Ixopo in KwaZulu-Natal; and in Kokstad in the Eastern Cape. In 2018 we continued with our international expansion under the EQUIP project and have offices in Port au Prince in Haiti, and Accra in Ghana.

EQUIP is a consortium of partners with extensive experience and technical expertise providing comprehensive high- quality HIV service delivery, innovating new approaches to service delivery, scaling viral load technology and analysing cost and outcome data to optimize HIV programmes.

Our approach:

MatCH's approach is to support ministries of health through provision of technical assistance and service delivery support for successful and innovative public sector HIV, TB, maternal, child and adolescent health interventions. This includes supporting the South African Government to roll out national programmes, including the National Core Quality Standards, the Global Plan of Action on PMTCT, Primary Health Care Re- engineering strategy and Community Health Worker programmes.

Staffing in 2018:

We have a multi- disciplinary group of senior academic staff, reflecting expertise in public health, child health, gender, HIV and TB.

By the end of the year under review, MatCH had a staff complement of over 700 people, with 18 staff actively involved in research.

Programmes in 2018:

In 2018 MatCH continued to play an important role in supporting health systems strengthening public sector health services. This included provision of HIV-related technical assistance and direct service delivery support to Ministries of Health in South Africa, Sub-Saharan Africa, and the Caribbean.

MatCH is a lead partner for the USAID- funded EQUIP project in Haiti, Ghana, Tanzania and Dominican Republic and supports USAID Missions, governments and PEPFAR implementing partners to rapidly scale-up UTT through advising on innovative models of ART service delivery and differentiated models of care.

In 2018 MatCH was the successful recipient of a new 5 year APACE award from USAID to strengthen responses for improved HIV and TB patient outcomes in eThekwini, Umgungundlovu and Harry Gwala districts in KwaZulu-Natal and Alfred Nzo District in the Eastern Cape. MatCH's adolescent, girls and young women portfolio included DREAMS funding in 2018 for facility level interventions in two high prevalence districts in KwaZulu-Natal.

The ELMA Philanthropies funded Unfinished Business project in eThekwini district focused on addressing the case finding and HIV related treatment needs of adolescents and children is also on- going. We continued to participate in important forums such as the National DOH Task Force for STI, HIV and AIDS Prevention, the National Health Research Committee, WHO Strategic and Technical Advisory Committee and the KZN Children's Hospital Steering Committee. MatCH continued to conduct in-site and inservice training on a wide range of HIV, TB maternal and child health topics. Since 2009 we have trained over 15,000 healthcare providers in KwaZulu-Natal. Key training programmes have included HCT/PICT; ARV and TB treatment guidelines; NIMART, Adult Primary Care, nutrition, pharmacy and data management.

All our training materials are in line with South African National and Provincial guidelines and policies. Training is planned and scheduled with the Department of Health.

MatCH is in the third year of a five-year U.S. Centers for Disease Control grant for Programmatic Implementation and Technical Assistance (TA) for HIV/AIDS and Tuberculosis (TB) Prevention, Care, and Treatment Services throughout the Health System in South Africa.

This is under the President's Emergency Plan for AIDS Relief (PEPFAR). Under this five-year grant, MatCH supports community-based HIV testing and evidence-based prevention programmes in the Harry Gwala, eThekwini and Umgungundlovu districts in KwaZulu-Natal.

Research activities in 2018:

Maternal, new- born and child health research, including HIV and infant feeding, is a key focus area of our work, led by Professor Jerry Coovadia, who is the Director of Health Systems at MatCH. He has been at the forefront of this field of work for many years. He is also actively involved in the development of WHO and National standards, and the implementation in South Africa of breastfeeding policies, which have had a positive impact on child health.

Numerous research activities and positive outcomes were achieved in 2018, including the following:

 MatCH continued to implement a WHO/ South African National Department of Health Pregnancy Registry pilot project to prospectively collect information about maternal health and medicines exposure during pregnancy and inform the establishment of a national sentinel surveillance system for major birth defects and still births.

The objectives of the project include the following:

- To collect information about maternal health and medicines exposure during pregnancy.
- To establish a national sentinel surveillance system for major birth defects and still births.

MatCH Research Unit Department of Obsterrics and Gynaecology Faculty of Health Sciences University of the Witwatersrand



PROFESSOR JENNIFER SMIT Executive Director MRU

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Maternal, Adolescent And Child Health Research Unit

MRU (Maternal, Adolescent and Child Health Research Unit) aims to answer priority questions that will translate into improving sexual and reproductive health outcomes through expanding access to appropriate and acceptable contraceptive, HIV prevention and related health technologies and services.

Who We Are

MRU is affiliated to the University of the Witwatersrand's Faculty of Health Sciences, in the School of Clinical Medicine and to the Department of Obstetrics and Gynaecology.

Our Mission

We aim to achieve the following:

- Conduct innovative research that informs policy and programmes.
- Conduct research that supports the development of new technologies on sexual and reproductive health, HIV and related diseases.
- Engage the community in informing research and improving service delivery.

Where we operate:

MRU is based in Durban and our team consists of highly skilled research, clinical, laboratory, community, data and administrative staff from a wide range of backgrounds including clinical, behavioural and social sciences.epidemiology.

Research publications in 2018:

In 2018, MRU published 12 articles in peer-reviewed journals from a wide range of our projects including a SRH/HIV health services integration intervention, a safer conception project, and a sex worker health service intervention. Other research publications focused on our core research areas including contraception, HIV prevention, safer conception and other areas of sexual and reproductive health.

Beyond research our outputs included contributing to the South African Guidelines to support HIV-affected individuals and couples to achieve pregnancy safely: Update 2018, and leading the development of the KZN Contraception and Fertility Planning Strategy, launched in December 2018.

Grant awards in 2018:

In the year under review, MRU successfully applied for and was awarded several grants through collaborations and self-initiated grant applications.

Research in 2018:

In the year under review, we continued our core research areas including contraception, HIV prevention, safer conception, menstrual management, postpartum depression and other areas of sexual and reproductive health. MRU engaged in pivotal research conducted with vulnerable populations, including youth, sex workers and residents of informal settlements. We continued our programme of work in Pre-exposure prophylaxis (PrEP) for HIV Prevention. One of these groundbreaking studies at MRU which started recruiting in 2017 is being carried out in collaboration with Harvard University and the Massachusetts General Hospital in Boston. This five-year NIH grant was awarded for the "PrEP Safer Conception for Women study" which will be offering PrEP as part of a safer conception package. A second NIH funded study - Siyaphanta, Siyavimba! is exploring female sex workers' (FSW) knowledge, attitudes, and experiences with preexposure prophylaxis (PrEP) and treatment as prevention (TasP), and other prevention options.

We completed study follow-up in our two research sites for the ECHO Trial (The Evidence for Contraceptive options and HIV Outcomes): A Multi-Center, Open-Label, Randomised Clinical Trial Comparing HIV Incidence and Contraceptive Benefits in Women using Depot Medroxyprogesterone Acetate (DMPA), Levonorgestrel (LNG) Implant, and Copper Intrauterine Devices (IUDs).

This trial is comparing the risks of HIV acquisition between women randomised to Depot Medroxyprogesterone Acetate (DMPA), Levonorgestrel (LNG) implant, and copper IUDs. The goal of the study is to answer the public health question of the relative risks (HIV acquisition) and benefits (pregnancy prevention) of three commonly-used, effective contraceptive methods among women who desire contraception. In a follow-on study to ECHO we are looking at contraceptive continuation in participants who completed the trial.

We commenced The Women's Health, Injectable Contraception and HIV study: randomized comparison of immunological, hormonal, physiological, psychological and behavioural effects of NET-EN versus DMPA contraception. This study is a collaboration with ECRU (Effective Care Research Unit) of the University of the Witwatersrand. During 2018, our microbicide research trials continued at the MRU Edendale Research Site with the IPM 032, a Phase IIIb follow-on trial to IPM 027. This is designed as an open-label clinical trial to collect additional safety data and to establish adherence to ring use. This study uses the Dapivirine Vaginal Ring in healthy, HIV-negative women who were enrolled in the Phase III Dapivirine ring trial IPM 027. Complementary socio-behavioural data collection is also underway to collect information around adherence in microbicide trials.

In our post-partum depression programme, we aim to decrease depression and increase adherence to HIV and SRH care for HIV- infected mothers. We commenced a new NIH funded study called PEPEHC (Evaluation of Postpartum Engagement in HIV Care) which aims to estimate the rate of attrition from HIV care and to identify factors associated with attrition from and retention in HIV care during the postpartum period. This study will enrol 500 pregnant women, living with HIV and diagnosed during the current pregnancy. Participants will be followed up over a period of two years

Our menstrual management programme commenced a new intervention which is introducing menstrual cups in a range of higher education institutions and Technical, Vocational and Training Colleges in KwaZulu- Natal (KZN). This project is being funded by the DREAMS Innovation Challenge Initiative.

Department of Health initiatives in 2018:

MRU continued to provide support to the Provincial and National Departments of Health (DoH) (SRH) in policy and programme issues in the area of sexual and reproductive health. In line with this, Mags Beksinska, Jenni Smit and Zonke Mabude provided led the revision of the KZN Contraceptive Strategy which was published at the end of 2018. We also completed a component of a study that aimed to explore the reasons for requesting removal of Implanon implants, and patterns of contraceptive use in women presenting to an urban reproductive health clinic.

Conferences 2018:

Internationally, MRU presented orals and posters at several conferences including the International Conference for Family Planning in Rwanda, the International AIDS conference in the Netherlands, the Research for Prevention (R4P) Conference in Spain and the European Society conference for Contraception in Hungary. Several staff were awarded full bursaries to attend some of the conferences.

Training and capacity building in 2018:

MRU focused on capacity building and training of researchers locally, regionally and internationally during 2018. MRU staff are supervising two PhD candidates (one in Uganda), and one Masters study.









PROFESSOR SHABIR MADHI Executive Director of the Wits MRC Respiratory & Meningeal Pathogens Research Unit & DST/NRF SARCHI Chair: Vaccine Preventable Diseases

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WITS RESPIRATORY AND MENINGEAL PATHOGENS RESEARCH UNIT

The Wits MRC Respiratory & Meningeal Pathogens Research Unit (RMPRU) aims to conduct epidemiological, clinical and basic science research into respiratory and meningeal infections. The unit seeks to improve the diagnosis, management and prevention of these diseases.

Who We Are

The VPD/RMPRU was established in 1997, with an original research mandate to investigate pneumococcal diseases at the molecular, epidemiological, clinical and pharmaco-logical levels.

Over time, the Unit has evolved to include investigating the clinical and molecular epidemiology of other bacteria and respiratory viruses that are associated with pneumonia and meningitis. The Unit has established itself to be a premier clinical trial facility for vaccine and training platforms and has undertaken pivotal studies on pneumococcal conjugate and rotavirus vaccines, which have helped inform the utilization of these vaccines in low-to-middle-income countries.



Global Leadership:

RMPRU is internationally recognized for the role it has played in the clinical development of livesaving vaccines such as the rotavirus vaccine and pneumococcal conjugate vaccine. Furthermore, it has been at the forefront of vaccine studies aimed at pregnant women, including reporting on the first placebo- controlled randomized trial of the influenza vaccine in pregnant women. It has also undertaken the first studies of an investigational multi-component Group B Streptococcus conjugate vaccine in pregnant women; a portfolio of research that is ongoing-including discovery research on other potential GBS vaccine epitopes. This is pertinent to Africa and South Africa, which has reported the highest incidence of invasive GBS disease globally. The unit also does important work on vaccines and their impact on Vaccine Preventable Diseases (VPDs).

Our Mission:

RMPRU conducts epidemiological, clinical and basic science research on vaccine preventable diseases, aimed at enhancing the health and survival of African children.

Research in 2018:

In the year under review, Prof Madhi and his colleagues published 46 publications, including multiple publications in the highest-ranking infectious diseases journals. The Research Chair was a senior author on many of these publications and much of the research which was based on outputs of post- graduate students under his supervision.

Rotavirus Vaccine Studies:

The Unit, under Dr Michelle Groome, undertook the first study on a sub-unit rotavirus vaccine, which is being developed as a possible improvement to the current live -attenuated rotavirus vaccine, the clinical development of which also was spearheaded in Africa at RMPRU. These results were published in Lancet Infectious Diseases. Since the introduction of rotavirus vaccine into the South African public immunization program, it has been estimated to prevent 3000 fewer diarrhearelated deaths in South Africa each year, as well as approximately 39,000 fewer hospitalizations.

Pneumococcal Vaccine Studies:

The Unit continues research on the prevention of pneumococcal disease through vaccination with the pneumococcal conjugate vaccine. This includes the work of two PhD students, which has investigated the direct and indirect benefits of vaccination. Included in this are studies which as shown that since South Africa introduced PCV into its public immunization program, based on evidence generated by RMPRU, annually more than 300 childrens lives are saved and there are approximately 125,000 fewer pneumonia hospitalizations in children, compared to prior to vaccine introduction.

Group B Streptococcus:

The Chair has also developed a strong research agenda in the field of Group B Streptococcus disease. Included among these were the first studies to show the association between immune mediators and risk of recto-vaginal GBS acquisition during pregnancy, as well as studies on correlates of protection against invasive GBS disease in Africa. RMPRU were proud organizers and hosts of the first International Symposium on Streptococcus Agalactiae Disease in Cape Town, South Africa in 2018.

This symposium brought together international experts and key stakeholders in the field of GBS and was aimed at progressing towards a GBS-free population. The Symposium had over 250 local and global attendees.

Stillbirths & Infant Mortality:

Studies by the Chair have established GBS to be an important contributing cause to not only neonatal death, but also stillbirths in South African women. These studies will be important in informing the design for future vaccines aimed at immunization of pregnant women to improve their birth outcomes and prevent invasive disease in their young infants.

Child Health & Mortality Prevention:

Following over R90 million in grants received in 2018, one of the largest ongoing grants received from the Bill and Melinda Gates Foundation in 2016 was for the Child Health and Mortality Prevention Surveillance (CHAMPS) study. The Chair is the South African Principal Investigator on the multi-center Child Health and Mortality Prevention Surveillance (CHAMPS) study which aims at undertaking minimal invasive tissue sampling to better ascertain the causes of stillbirths and under-5 deaths in high morbidity and mortality settings.

The RMPRU championed the piloting of MITS through a pilot study between 2015 and 2016, which contributed to the Bill and Melinda Gates Foundation committing funding to the CHAMPS program.

The CHAMPS program evolved into the establishment of a Health and Demographic Surveillance Site (HDSS) in Soweto, one of the first of its kind in an urban-African setting. The HDSS will initially focus on the surveillance of pregnancy outcomes and under-five childhood deaths.

Vaccinology in 2018:

In 2016, RMPRU in partnership with NICD hosted the first Advanced Vaccinology course in Africa (Afro- ADVAC), which was ten days long and took place in Muldersdrift, South Africa. The Unit was again proud organizers and hosts of the second Afro- ADVAC in September 2018. The course involved presentations and workshops led by international and local experts in the field of vaccinology and immunology. Delegates from over 32 African and Asian low-to-middle-income countries participated in this course, which is planned to take place every second year.

Capacity building in 2018:

The Unit continued to attract talented academics and supervised several key research initiatives.



Grant awards in 2018:

The Unit was the recipient of many grants during the year under review. Substantial grants came from the following foundations and organizations:

Grant funded research:

- The Bill and Melinda Gates Foundation
- European Research Council
- Murdoch Children's Research Institute
- University of Colorado
- Imperial College of Science
- Vanderbilt University
- CDC Foundation
- Emory University
- University College London
- National Institute of Health
- Medical Research Council SA
- European and Developing Countries
- Clinical Trials Partnership

Industry funded research:

- MedImmune
- Julius Clinical Research B.V
- Serum Institute of India Limited
- Biovac Institute
- Pfizer
- MSD
- Glaxosmithkline
- Novavax
- PATH Vaccine Solutions
- Sanofi/Aventis Pasteur









PROFESSOR MAUREEN COETZEE Unit Director

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WITS MEDICAL ENTOMOLOGY RESEARCH GROUP

The Wits Medical Entomology Research Group investigates the transmission and control of malaria in African mosquito populations and is affiliated to the Wits Research Institute for Malaria.

Who We Are

The Medical Entomology Research Group is affiliated to the Wits Research Institute for Malaria. The team consists of over two dozen academics, specializing in areas such as malaria vector biology, vector control, parasitology, epidemiology, chemistry, pharmacology and clinical medicine. Our team is made up of leading researchers, professors and academic lecturers.



Capacity building in 2018:

The unit had two post-doctoral fellows registered in the year under review, along with the following post-graduate students:

- 15 PhD students
- 1 D-Tech
- 22 MSc students
- 2 MMed

Publications in 2018:

The unit published in several journals. In the combined fields of Entomology, Parasitology and Tropical Medicine, the top 25% of journals have impact factors (IF) above 2.00. In Pharmacology and Pharmacy, it is 3.3 and above. We published 31 papers combined from Entomology (19), Parasitology (1), Pharmacology (4) and Epidemiology (7).

Awards & Recognition in 2018:

Our Unit head, Prof Maureen Coetzee was awarded the following:

- SA-MRC Platinum Award for outstanding lifetime scientific contributions to health research.
- Member of the Malaria Policy Advisory Com mittee (MPAC) of the WHO Global Malaria Programme, 2017-2020, reporting to the Director General, WHO.
- Keynote speaker, 9th International Congress of Dipterology, Windhoek, Namibia, December 2018.

Prof Basil Brooke:

- WHO representative for the UNEP DDT Expert Group 2016-2019.
- Member of the scientific committee for the Annual Malaria Research Conference hosted by the National Department of Health and the SADC secretariat 2017-2018.
- Plenary speaker, Pan Africa Mosquito Control

Association Conference, Victoria falls, Zimbabwe 2018.

Elected Member of the Academy of Science of South Africa 2018.

Prof Immo Kleinschmidt:

- Member of the WHO Vector Control Advisory Group 2016-2018.
- WHO representative for the UNEP DDT Expert Group 2016-2019.
- External scientific advisory committee of the Innovative Vector Control Consortium, Liverpool, UK
- Bioko Island Malaria Control Project Technical Advisory Group, 2008-2018
- Chair of DSMB of Dengue Wolbachia Trial, Indonesia, 2017-2020

Prof Lizette Koekemoer:

- Member of External Scientific Advisory Committee in a large EU Horizon 2020 project, DMC-MALVEC (www.dmc-malvec.eu) 2017-2019.
- Recipient of the Faculty of Health Science's Exceptional Service awards.
- Member of the scientific committee for the Annual Malaria Research Conference hosted by the National Department of Health and the SADC secretari at 2017-2018.
- Plenary speaker, Pan Africa Mosquito Control Association Conference, Victoria falls, Zimbabwe 2018.
- Member of Pan Africa Mosquito Control Association Women Entomologists working group, Zimbabwe 2018.
- Invited speaker, 7th Multilateral Initiative on Malaria Pan-African Conference, Dakar, Senegal 2018.

Grant awards in 2018:

The Unit received a wide distribution of grant awards, including the following:

NIH, MRC, DFID, Welcome Trust, Bill & Melinda Gates, Foundation, International Atomic Energy Agency, CDC, WHO, NHLS, FRC, NRF and the Claude Leon Foundation.

A: Entomology:

- International Centre of Excellence in Malaria Research (ICEMR): lead by the Johns Hopkins Malaria Research Institute (USA), carrying out surveillance for insecticide resistance in Zambia and Zimbabwe,2017-2023.
- Vector-parasite infection study: funded by the MRC-SHIP programme, it is now possible to successfully infect malaria mosquitoes with Plasmodium falciparum.
- Sterile Insect Technique project: continued in northern Kwazulu - Natal to investigate the use of sterile male mosquitoes for population suppression, funded by IAEA, Austria and DST.
- Alternative vector control methods: in collaboration with CDC, Atlanta, ICEMR and WHO/ AFRO, both adulticides and larvicides have been tested.
- Effects of oxidative stress, blood ingestion and environmental contaminants on life history parameters and insecticide resistance in malaria vector mosquitoes: currently funded by the NRF Thuthuka programme.
- Identifying the entomological drivers of residual malaria transmission in all of South Africa's malaria endemic provinces: currently funded by NDoH, NICD and the NHLS Research Trust.
- Namibia targeted parasite elimination (TPE) and reactive vector control (RAVC) trial: this is a cluster randomised trial, led by University of California San Francisco (UCSF), in partnership with University of Namibia (UNAM), the University of Texas Southwestern Medical Centre, the

London School of Hygiene and Tropical Medicine, WRIM and the Namibia Ministry of Health and Social Welfare, to evaluate a strategy of the coordinated use of vector and parasite control, targeted at the individuals at highest risk for malaria.

Other projects are aimed at understanding insecticide resistance, physiology and other important phenotypes of epidemiological significance in malaria vector mosquitoes.

B: Parasitology:

- Research to screen and evaluate the activity of compounds against Plasmodium falciparum game to cytes continued in collaboration with the University of Pretoria and CSIR through a gametocyte consortium funded by the MRC-SHIP programme. This research is carried out in partnership with Medicines for Malaria Venture (MMV) in Geneva, Switzerland.
- A collaborative SHIP-funded project with the WRIM entomologists to infect mosquitoes continued as indicated above.
- Structural characterisation of malaria p r o teins in collaboration with the Institut Laue-Langevin and the European Synchrotron Radiation Facility (ESRF), Grenoble, France and Keele University, UK.
- Parasite phage display projects to identify protein-protein interactions in collab or a tion with Tufts University, Boston, USA.
- Parasite protein trafficking pathways in collaboration with Philipps University, Germany.
- Evaluation of automated diagnosis of malaria with analysers from Sysmex, Japan.
- Programmed cell death in the intra- erythrocytic stages of the parasite life cycle in collaboration with Victoria University, Melbourne, Australia.

- Prevalence of markers of anti-malaria drug resistance in patients presenting with malaria in Johannesburg in collaboration with Dr J Raman, WRIM/ NICD.
- Establishing clinical isolates of currently circulating malaria parasites in collaboration with Prof C Menezes from WRIM/Wits Chris Hani Baragwanath hospital.
- Molecular study on cytochrome b5T116S polymorphisms in malaria patients in collaboration with Prof C Menezes.

Research projects at the NICD included the following:

- A serology study to assess past expo s u r e to malaria in Limpopo and Mpumalanga as part of a collaboration with the London School of Hygiene & Tropical Medicine and Limpopo and Mpumalanga Provincial Malaria Control Programmes.
- A molecular study to determine the prevalence of antimalarial resistance markers in South Africa in collaboration with the National Department of Health, the Limpopo and Mpumalanga Provincial Malaria Control Programmes.
- A clinical trial assessing the safety and efficacy of adding a single low primaquine dose to standard malaria treatment in collaboration with the University of Cape Town and Mpumalanga Provincial Malaria Control Programme.
- A molecular study nested within National Malaria Foci Clearing Programme to determine the prevalence of asymptomatic and gametocyte carriage in col=laboration with the National Department of Health, KwaZulu-Natal and Mpumalanga Provincial Malaria Control Programmes.
- Professor M. Markus in the School of Animal, Plant & Environmental Sciences, investigated

quiescent primate malaria parasites in mice and reviewed relapsing malaria.

C: Pharmacology:

- The evaluation of the antimalarial activ-ity of several synthetic or naturally derived compounds continued in collaboration with North-West University, University of Johannesburg, University of Witwatersrand and University of KwaZulu-Natal.
- South African species of liverworts were investigated in collaboration with the Tswane University of Technology, and some of the plants subjected to fractionation. Isolated compounds were evaluated for antimalarial and anticancer activity.
- In collaboration with Dr HE Mukaya and Prof XY Mbianda (University of Johannesburg), we designed and synthesized novl water-soluble carrier polymers bioreversibly connected to quinine and cisplatin, such that the conjugates obey superior pharmacokinetics relative to non- polymeric drugs, with resultant enhancement of bioavailability and therapeutic effectiveness against malaria and cancer.
- Prof C Menezes, co-investigators with Prof RL
 van Zyl and Prof A Karstaedt on a clinical study
 assessing the clinical and pharmacological dy namics between the malaria parasite and its
 human host.
- Prof RL van Zyl, Prof C Menezes and Prof A
 Karstaedt collaborated on a clinical study examining the retrospective outcomes and cost
 analysis of anti-malarial treatment in HIV-infected patients in a tertiary hospital setting in
 Soweto, South Africa.

D: Chemistry:

- Synthesis and characterization of spiroxindole derivatives as potential antimalarial agents.
- Synthesis of antiplasmodial spiroindo lone analogues.
- Synthesis and modification of antiplasmodial antifolates.
- Synthesis and evaluation of antimalarial agents as inhibitors of Plasmodium falciparum calcium-dependent protein kinases.

E: Internal Medicine:

 Collaboration with Prof RL van Zyl and Prof T Coetzer looking at malaria at Chris Hani Baragwanath Academic Hospital – a study assessing the clinical and pharmacological dynamics between the malaria parasite and its human host including a cost analysis of antimalarial treatment in HIV-infected patients.









THE WITS CLINICAL RESEARCH UNIT

The Wits Clinical Research (WCR) Unit is a clinical research site management organization. We operate as a business unit in the Integrated Health Delivery Network Division of the Wits Health Consortium.

Who We Are

We are a clinical research site management operation.

DR AYSHA BADAT HOD of WCR

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CHRIS HANI BARAGWANATH CONTACTS:

Dr Aysha Badat Cnr College / Theatre Roads. CHBAH Tel: 011 983 6501 Fax: 011 938 9958

WEB: www.wcr.co.za

What we do:

WCR provides and independently manages clinical research sites, primarily in support of Wits-related academic hospitals, including the Charlotte Maxeke Johannesburg Academic Hospital, the Wits Donald Gordon Medical Centre and the Chris Hani Baragwanath Hospital.

This large geographical coverage, along with an extensive patient database, and passionate recruiters at academic and government hospitals, day hospitals and local physicians, ensure for successful patient enrolment in the studies at WCR. We reach out to different specialties on a daily basis to encourage and promote new clinical trials.

Our sites:

Each site provides comprehensive site facilities including doctor consultations, consulting rooms, treatment rooms, procedure facilities, laminar flow pharmacies, laboratories, study coordinators and support staff.

We rent our facilities, purchase our consumables and employ our own professional staff, including doctors, nurses and pharmacists.

Our aim:

Our aim is to benefit key stakeholders, including the following:

Private and public patients:

We offer patients an opportunity to participate in clinical trials, providing them with quality care and free treatment and disease management costs, as these are covered by our trials.

Healthcare funders & medical insurers:

We generate savings for health care funders of •

trial patients (such as medical aids and health departments) by covering the Cost of the relevant investigations, treatment and management of trial conditions for patients.

Investigators:

We generate publications and associated financial benefits for individual investigators and where relevant, their academic departments. Every year we recruit more new investigators thathave never done clinical trials before.

Patient referrals:

We receive patient referrals for participation in clinical trials from both the private and public sectors.

Areas of expertise:

WCR has worked with many pharmaceutical companies and contract research organizations.

Our units have proven expertise conducting phase II-IV studies in the following fields:

- Cardiology
- Cardiovascular risk factors:
- Hypertension
 - -Smoking cessation
 - Obesity
 - Hypercholesterolemia
 - Diabetes
- Endocrinology
- Rheumatology
- Hematology
- Oncology
- Infectious diseases
- Acute medicine and ICU
- Respiratory
- Nephrology
- Gastroenterology

- General surgery
- Vascular surgery
- Urology
- General medicine
- Vaccines
- Pediatric trials
- Orthopedics

Standards / Procedures:

Adherence to Good Clinical Practice Guidelines (ICH GCP) and South African Guidelines is first and foremost at WCR, and site Standard Operating Procedures reflect this commitment.

Achievements:

We have become an internationally recognized clinical trial site due to our excellent patient care, quality data and almost 100% retention.









WITS DEVELOPMENT ENTERPRISE DIVISION



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WITS DEVELOPMENT ENTERPRISE DIVISION

The Wits Development Enterprise Division (WDED) is a multidisciplinary division focusing on development projects in the health and related sectors.

Who We Are

The Wits Development Enterprise Division (WDED) is a division of the Wits Health Consortium undertaking multidisciplinary development projects.

One of our key focus area is TB. We manage the Global Fund Regional response to TB in the Mining Sector in Southern Africa (TIMS). Other priorities also include HIV, malaria, immunization, nutrition, applied data analytics and information technology, capacity building, and Occupational Health.

Our key funders:

Our main funders include international financing organizations, governments and grant income.

What we do:

Our work is focused on having a positive impact on policy development. This includes the harmonization of policy and legislation for TB in the mining sector across the 10 participating countries as well as supporting the expansion of health and safety services in southern Africa.

TIMS:

TB in the Mining Sector in Southern Africa (TIMS) is our core programme. The programme is funded by the Global Fund. This grant is focused on reducing the TB burden in the mining sector in 10 southern African countries.

TIMS operates in 10 southern African countries including, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

In 2018 the TIMS programme:

- Operated 10 Occupational Health Service Centres (OHSC) in 7 countries and launched the 11th one in Zambia
- Saw about 25 000 clients in these centres and submitted just under 5 000 claims for compensation to the MBOD
- Selected 2 SRs to implement Phase 2 of the TIMS grant – until Dec 2020
- Phase 2 of the grant was significantly delayed due to budget adjustments and the TIMS project is now implementing an acceleration plan.
 WE are confident that with the calibre of SRs selected, we will deliver the key elements of the grant on time.

The grant continues to contribute to the reduction of TB in the southern African Mining sector with a focus on finding missing TB cases amongst the mining population.

Our teams:

Our teams consist of a combination of academic and non- academic specialists working across the southern African region. All projects follow a robust project management approach via a structured Project Management Office (PMO).

Our research: Important research and participation in key events in the past year included the following:

- Submitted and presented papers and posters at the South African AIDS conference as well as at the International AIDS conference in Amsterdam.
- Conducting a study on the harmonization of TB protocols in the SADC region.
- Conducted a pre-feasibility and Feasibility study to establish a Trauma and Rehabilitation facility in Windhoek in Namibia
- Developed a framework and plans for pandemic preparedness and response for the World Bank
- Conducted an occupational health audit for the Dundee Precious METALS – TSUMEB Smelter in Namibia

Future plans:

Looking ahead, our core aims and targets include leveraging additional funding to support TIMS (from both donors and the private sector). We also plan to expand business development in our key focus areas of specialization as well as packaging robust health sector consultancy offerings.



Other Research Units



For more information contact us

TEL: (011) 933 0341/ 8052/ 8804

WEB:

www.bathopelebreastunit.co.za

The Batho Pele Breast Unit operates from the Chris Hani Baragwanath Hospital in Soweto. This unit is dedicated to the treatment of all breast-related diseases, especially cancer. We have no waiting list and we offer the following services:

- A specialist consultant-driven service
- Prompt assessment and diagnostic procedures
- A multidiscipline approach to ensure the best care for all patients
- Specialised expertise in oncoplastic breast conserving surgery
- Personalised follow up
- Commitment to training of both undergraduate and post-graduate doctors and nursing staff
- We do epidemiology, health system strengthening and molecular biology grant funded research.



For more information contact us

TEL: (011) 356 6488

WEB: www.dgmc.co.za/ highly-specialised-unit/transplant

The Wits Donald Gordon Medical Centre's (WDGMC's) Transplant Unit is a leading centre in liver, kidney and simultaneous kidney-pancreas transplantation. Professor Jean Botha leads the unit and has performed many pioneering transplant surgeries. The unit seeks to transform the South African organ transplant landscape.

Currently, this is the only Transplant Unit doing living donor liver transplantation and pancreatic transplantation in Southern Africa. In striving to promote and develop the discipline of organ transplantation in South Africa, the Unit is able to successfully transplant solid organs in both children and adults. The unit is affiliated to the School of Clinical Medicine and the Department Internal Medicine-Hepatology.



For more information contact us

TEL: (011) 488 3538 or (011) 643 2935

The WCR-Lipids Unit is affiliated to the Department of Medicine in the Faculty of Health Sciences at the University of the Witwatersrand. Our focus includes the epidemiological, clinical and biochemical aspects of common diseases affecting lipid and glucose metabolism in the different ethnic groups of Southern Africa. These include familial hypercholesterolemia and other dyslipidemias, insulin resistance, diabetes mellitus as well as other related metabolic disorders.

The Unit is well recognized both nationally and internationally for its work on familial hypercholesterolaemia (FH), and has one of the largest cohorts, if not the largest cohort, of homozygous FH patients in the world. The Unit has contributed, and continues to contribute, to the management of these patients. Although only a small Unit, the Unit has been involved in over 40 clinical trials with novel lipid-modifying agents over the past 25 years.

The Unit continues to research novel therapies such as antisense apo B-100, PCSK9-inhibitor monoclonal antibody therapy, siRNA PCSK9-inhibitor therapy (Inclisiran), and more recently Angiopoetin-like protein 3 (ANGPTL3) inhibition in this patient group.



For more information contact us

TEL: (010) 601 7427

WEB: www.rhap.co.za

The Rural Health Advocacy Project (RHAP) is affiliated to the Wits Centre for Rural Health in the Department of Family Medicine. The Project advocates for equitable access to quality healthcare for rural communities across South Africa.

Informed by the voices of rural healthcare workers and communities on the ground, partner organisations, stakeholders and researchers, RHAP uses its urban-based access to decision-makers to conduct advocacy, generate debate, monitor implementation of health policies in rural areas, support pro-equity government interventions, and influence decision-making that is in tune with rural realities.

While small in size, RHAP is large in reach through its innovative programmes and strategic partnerships and networks across the country. The RHAP focuses primarily on issues affecting access and equity within the primary healthcare context, ranging from access to healthcare workers in rural areas to adequate budgets and rural-friendly policies.

The RHAP was founded in 2009 by the Wits Centre for Rural Health and the Rural Doctors Association of Southern Africa, who remain among RHAP's core partner organisations to date.



The Wits node of the DST/NRF Centre of Excellence for Biomedical TB Research (CBTBR) is an integral component of a tri-nodal Centre of Excellence, funded by the Department of Science and Technology/National Research foundation, with partnering nodes at Stellenbosch University and the University of Cape Town.

The ultimate goal of the CBTBR is to contribute to elimination of TB in South Africa by undertaking cross-disciplinary research that can be translated into novel health interventions and/or policy. Research at the Wits node spans the spectrum from fundamental investigations in mycobacterial metabolism across to clinical research and diagnostic support. Key areas of activity can be divided into four thematic groupings, these are:

Identification and validation of novel drug and vaccine targets, involving an analysis of vulnerable drug targets in various areas of mycobacterial metabolism. In this regard, the Wits node has focused on the bacterial cell wall as a tractable area for the discovery of new drug targets, in particular the peptidoglycan polymer, which has been the target of successful chemotherapy in other bacterial diseases. Enzymes that remodel the peptidoglycan are essential for bacterial cell division and the Wits node has uncovered a novel class of amidases and low molecular weight penicillin binding proteins that are essential for bacterial survival. In addition, targeting energy metabolism has recently proved beneficial for tuberculosis disease as evidenced by the discovery of Bedaquiline, the first new TB drug to be approved for use in over four decades, with a mode of action that kills bacteria through depletion of energy production. Considering this, the Wits node has also focused on identifying additional vulnerabilities in the mycobacterial electron transport chain.

- Characterization of differentially culturable tubercle bacteria (DCTB) in patients with active tuberculosis disease. Treatment of tuberculosis is protracted, requiring six months of combination chemotherapy to obtain non-relapsing cure. It has been hypothesized that this long duration of chemotherapy is necessitated by the presence of organisms that are tolerant to drug treatment. The Wits node of the CBTBR has further investigated this phenomenon through the quantification and characterization of DCTB in HIV infected and uninfected tuberculosis patients with pulmonary disease prior to the initiation of TB treatment. Furthermore, the CBTBR has established two longitudinal cohorts that are aimed that monitoring the response of these organisms to treatment and further follow up of patients to record any incidence of recurrent tuberculosis disease.
- Construction, confirmation and bulk production of diagnostic verification reagents for molecular tuberculosis diagnostics. For the past 5 years, the Wits node of the CBTBR has been providing support for the rollout of tuberculosis molecular diagnostics in over 30 countries. For this, the CBTBR has developed a set of verification reagents that can be used to declare newly installed diagnostic devices as "fit for purpose" and for continuous external quality assurance programs. These reagents can be provided at low cost and do not require a cold chain, thus making them suitable for low resource settings. Recently, the CBTBR has developed a new generation of diagnostic reagents that are easier to produce and are more cost effective than earlier versions. These are currently being field tested.
- Development of novel screening modalities for new tuberculosis drugs. Screening
 for new tuberculosis drugs often involves testing the ability of compounds to inhibit
 growth of tubercle bacteria in axenic culture. Often, these culture conditions poorly
 mimic the environment encountered by bacteria in the human lung, thereby limiting
 the identification of new compounds with potent activity. To address this, the Wits
 node of the CBTBR has developed counter screening models that generate drug tolerant bacteria to use in screening endeavors. Three counter screening models have
 been established, which include maintaining bacteria under carbon starvation conditions, in biofilms and in media containing nitrate as the sole nitrogen source. These
 models are now offered to drug development consortia.



For more information contact us

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QxPath is an academic and private pathology collaboration. QxPath is a new and exciting a joint venture between the Wits Health Consortium and Lancet Laboratories, was formed in July 2017 as an academic full-service medical laboratory of excellence.

QxPath's mission is to:

- provide ISO-accredited laboratory services to the Wits Medical School's network of private sector clinical service providers - Donald Gordon Medical Centre, Folateng and others to be acquired as private sector platforms for medical student and registrar training
- provide medical student and registrar training in the laboratory sciences at Qx
 Path and Lancet's laboratories
- promote the introduction of cutting-edge medical laboratory technology into the Wits Medical School's networks
- contribute to research and publications
- participate in modelling for the inclusion of private laboratory services in the NHI rollout

QxPath leverages on the expertise of the Wits Faculty of Health Sciences academic and support staff, Wits Health Consortium and from Lancet's 120 Pathologists and infrastructure. These resources will enable QxPath to deliver on its mission and build its capability to support Wits Medical school's vision for public-private partnerships into the future. QxPath was officially introduced by Prof Martin Veller, Dean of the Wits Medical School, and the Chancellor of the University, Dr Judy Dlamini, at the recent opening of the DGMC new Transplant building recently. Prof Martin Hale has joined the team to provide ana-tomical pathology services to the Transplant unit and other disciplines at DGMC.

QxPath is gearing up, with the assistance of Prof Johnny Mahlangu, to offer rotations to Wits pathology registrars in all disciplines at it and Lancet's facilities. This partnership strengthens Academic Pathology.





Message from CEO MR ALFRED FARRELL

Wits Health Consortium (WHC) is an entity which is wholly owned by the University of Witwatersrand (Johannesburg operated for the benefit of its Faculty of Health Sciences. WHC is available for use by the Faculty as an entity through which it is able to undertake third-stream activities related to its academic duties. WHC is proud that our heads of divisions have chosen WHC as the entity in which to house their divisions.



Message from the Dean: Faculty of Health Sciences PROF. MARTIN VELLER

The University of the Witwatersrand aims to be a leading research-intensive university, with are putation for relevance. While we are rooted within Africa, with a strong sense of the continent's developmental challenges, our research also addresses the "grand challenges" of the world. The Faculty of Health Sciences, in particular, is dedicated to contributing positively to the most basic of human rights: the health and well-being of people in general, but with specific focus on the most vulnerable populations in our society.

Effective delivery of appropriate healthcare interventions are the result of excellence in teaching as well as learning and we are particularly proud of our postgraduate training programmes that are helping to develop a robust research pipeline that can contribute tour knowledge economy.

BEHIND OUR BRAND IS A GREAT TEAM





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