

Contact Information

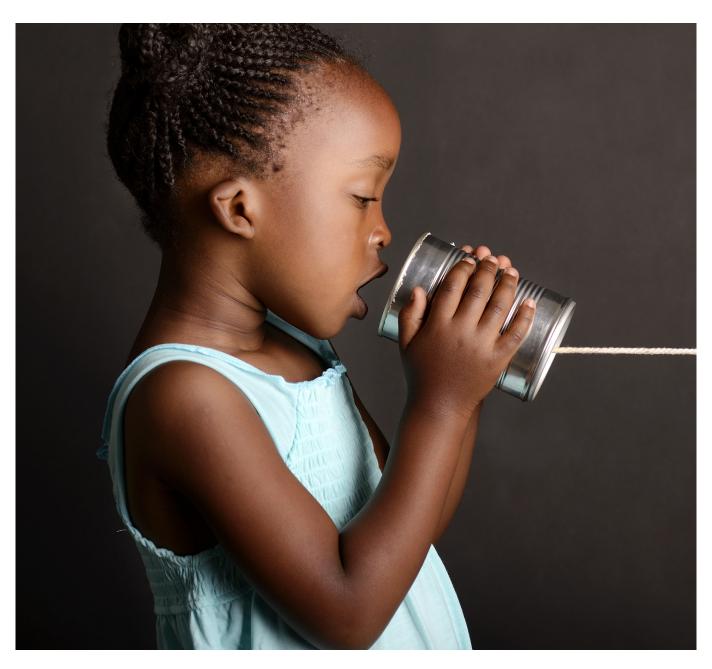
Wits Health Consortium

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Wits Health Consortium 2017 Annual Review

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We are the result of our hard work.

Our passion for what we do makes us
pioneers in our sector.

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.

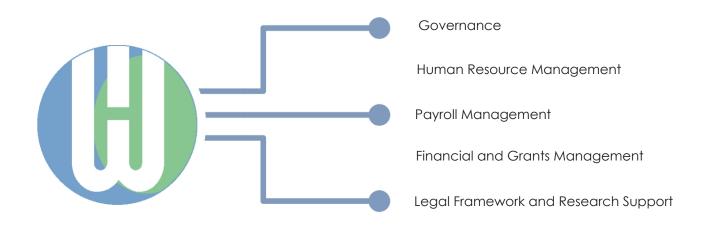


The University of the Witwatersrand - Great Hall

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 260 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.

Our SSC supports research activities and also provides the following support:



We free up academics and researchers to do what they do best and enable them to pursue specialist research in their respective fields of expertise.

OUR SUBSIDIARIES

Speer IT Services and Solutions

Best practice in systems, software, network connectivity, cloud storage and IT management solutions



Ukwenza (Print Studio)

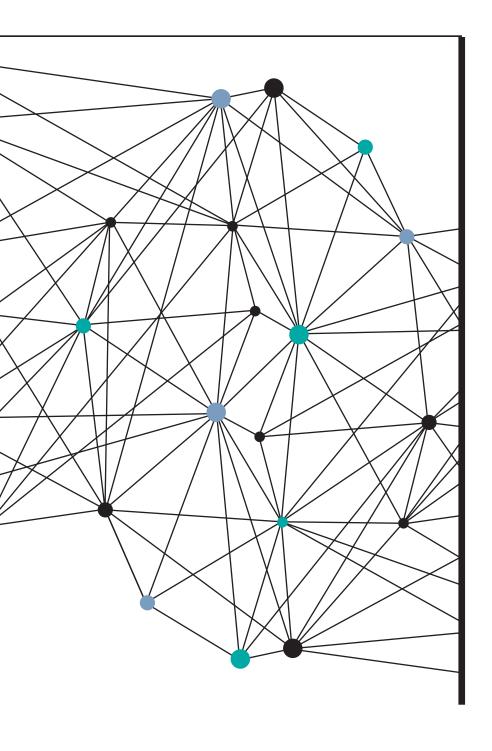
Print media services, graphic design, multi-media productions, presentations, branding and conference packages

Academic Advance (Training and Development)

Specialist training in the field of Clinical Research, example GCP, Human Resource Management and Critical Skills

Integrated Health Delivery Network

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



FINANCIAL OVERVIEW

WITS HEALTH CONSORTIUM PROPRIETARY LIMITED

STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME For years 2017 and 2016

	2017	2016
	R	R
Surplus before operating expenses	2,011,873,550	1,573,710,183
Expenses	(2,022,985,613)	(1,569,938,702)
Personnel costs	1,145,688,792	917,041,451
Consultants	106,757,226	99,205,904
Depreciation	40,801,148	29,884,500
Operational costs	626,918,568	444,939,393
Travel costs	86,636,373	64,705,781
Training costs	16,183,506	14,161,673
Surplus/Loss before net finance income	(11,112,063)	3,771,481
Net finance income	44,400,579	39,849,607
Surplus before income tax	33,288,516	43,621,088
Income tax expense	(209,255)	(92,374)
Surplus for the year	33,079,261	43,528,714
Attributable to		
CORE	16,705,604	15,370,117
Syndicates - Restricted	-	-
Syndicates - Unrestricted	16,373,657	28,158,597
Dividend declared to the University of Witwatersrand, Johannesburg	11,000,000	6,800,000

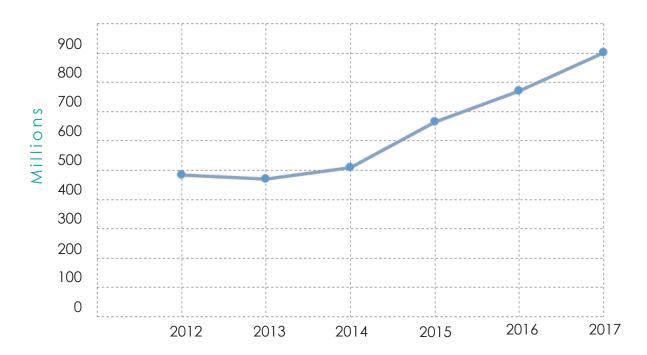
WITS HEALTH CONSORTIUM PROPRIETARY LIMITED

STATEMENTS OF FINANCIAL POSITION For years 2017 and 2016

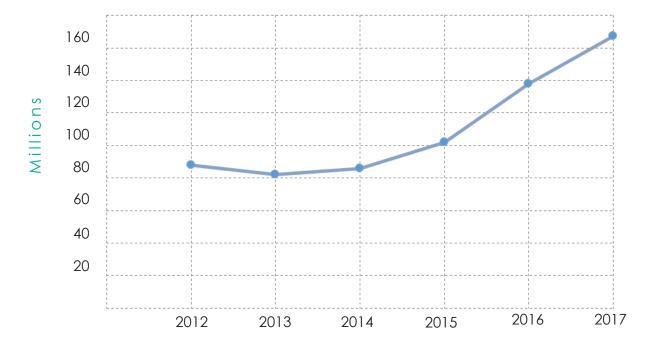
	2017	2016
	R	R
ASSETS		
Non-current assets		
Property, plant and equipment	167,258,848	138,016,083
Goodwill	485,608	485,608
Deferred tax	39,867	53,107
	167,784,323	138,554,798
<u>Current assets</u>		
Inventory	1,354,611	1,352,733
Trade and other receivables	297,163,351	238,123,374
Tax receivable	23,280	111,088
Cash and cash equivalents	901,983,712	770,413,738
	1,200,524,954	1,010,000,933
Total Assets	1,368,309,277	1,148,555,731
EQUITY AND LIABILITIES		
Equity		
Share capital	100	100
Accumulated reserves	373,834,374	351,755,113
	373,834,474	351,755,213
Liabilities		
Non-current liabilities		
Borrowings	1,101,337	1,654,334
Deferred income	-	1,267,503
Deferred tax	-	-
	1,101,337	2,921,837



CASH BALANCES



PROPERTY, PLANT AND EQUIPMENT

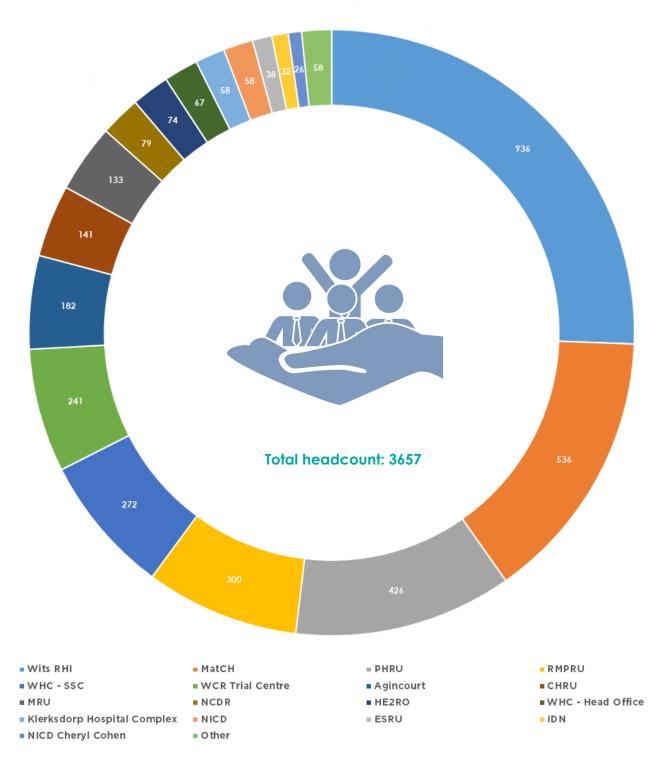


DIVIDEND DECLARATIONS



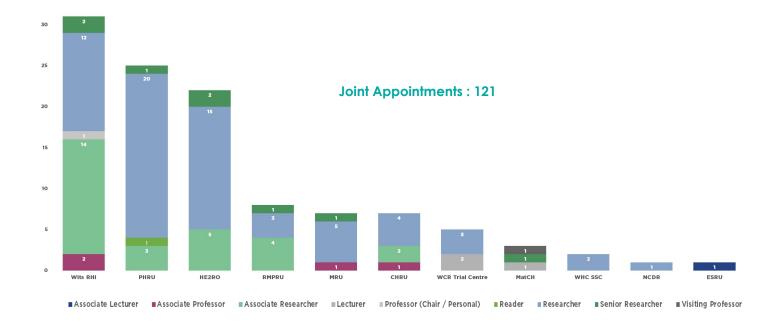
2017 HUMAN RESOURCE OVERVIEW

HEADCOUNT @ 31/12/2017

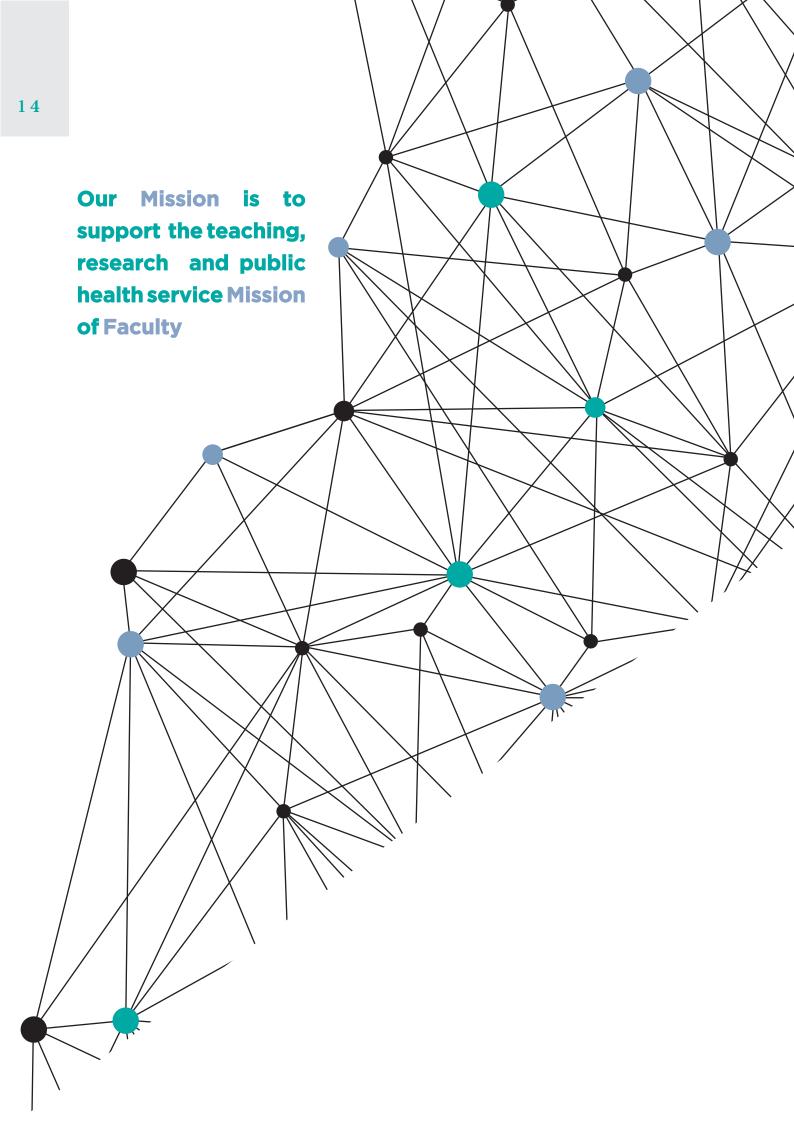


2017 HUMAN RESOURCE OVERVIEW CONT.

JOINT APPOINTMENTS @ 31/12/2017









Vision, Mission and 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 Faculty; either through the provision of commercial and administrative support for income-generating activities ancillary to 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.

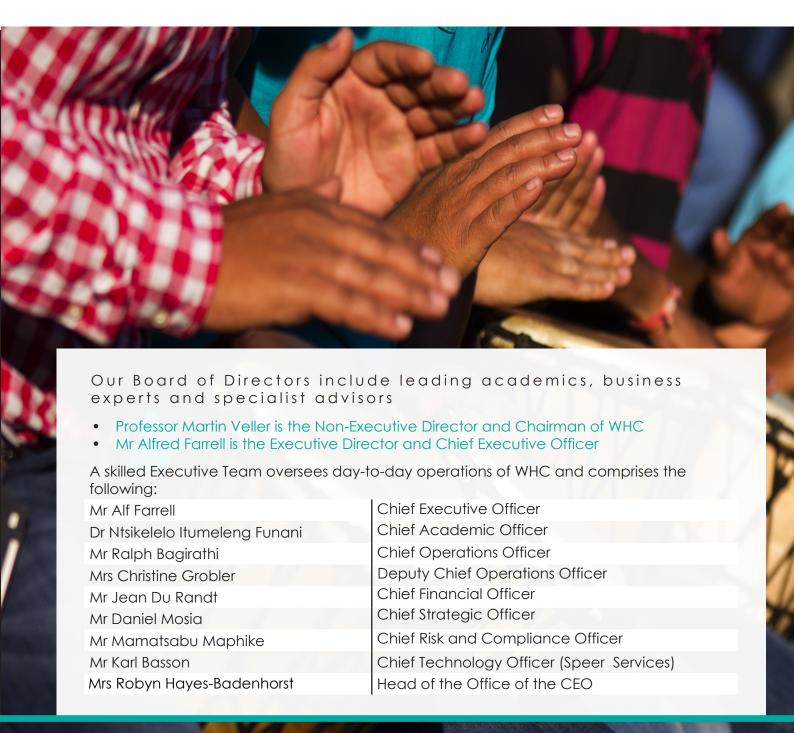
Respect - We are courteous, conscientious and respectful in our dealings with our customers, employees, Faculty and the communities where we work.

Variety - We embrace different viewpoints and support mutually beneficial partnerships among a diverse 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.



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.



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

Professor Veller is Dean of the Faculty of Health Sciences at the University of the Witwatersrand and a Professor in the University's Department 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



Executive Director and Chief Executive Officer

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

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, Alf 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 2016



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.



Associate Professor Maria Papathanasopoulos

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 conduct innovative research on HIV-1 drug discovery, and vaccine designs that are recognised at a national, regional 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 the International **AIDS** Foundation, Vaccine Initiative Innovation Fund. the Carneaie Foundation. the Poliomyelitis Research Foundation and several others.



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

Professor Rees is Executive Director 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 expert knowledge in physics and nuclear research.



Mr Mahomed Salim Ismail (Mac) Gani

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
- Strategy and Investment Committee
- Academic Oversight Committee
- Social and Ethics Committee (incorporating Sustainability Committee)
- Directors' Affairs Committee







Professor Helen Rees

Executive Director of the Wits Reproductive Health and HIV Institute

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Wits Reproductive Health 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 evidence-based providing policy development advocácy. expertise cover HIV, Its areas of and Reproductive Health and Vaccine Preventable Diseases.

Who we are: The Wits Reproductive Dolutegravir leading African research institute that patients and has fewer side effects. forms part of the University of the Witwatersrand's Faculty Sciences.

Wits RHI has been tackling Africa's health challenges through science and innovation for over two decades, with an unparalleled track record conductina world and contributing to health policy.

Our areas of expertise encompass HIV, SRH and vaccine preventable diseases (VPDs), with an increasing focus non-communicable diseases, as well as the intersections between these areas

to improve health outcomes at a national children with tuberculosis disease. and global level, through research, technical assistance, advocacy, policy development. strenathenina.

Wits RHI is a UNAIDS and South addressing the HIV epidemic. African Medical Council Research (MRC) collaborating centre as well as (UNFPA) strategic partner.

Key Developments in 2017: HIV/TB The ADVANCE Programme led by Wits RHI continued as the world's largest set of studies on ARV treatment optimisation. Results coming from this study facilitated the introduction of antiretrovirals which will be introduced in South Africa next year that are cheaper and have fewer side effects than the drugs that are currently available.

Clinical trials have shown that treatment regimens including dolutegravir work faster, have fewer side effects and demonstrate greater potency against used in Africa and other poor countries.

is a highly Health and HIV Institute (Wits RHI) is a antiretroviral, which is well tolerated by

> Health Patients are therefore more likely to be adherent and more likely to be virally suppressed - which means that they are not likely to transmit the virus to others.

With regards to HIV/TB co-morbidity, Wits of RHI initiated the TB CHAMP study, a phase class research, III cluster randomised placebo - controlled implementing sustainable programmes trial will assess the efficacy of preventive therapy in child contacts of multidrugresistant tuberculosis.

Children less than five years are at the highest risk of progressing to TB disease following infection. We also started recruiting participants for the OptiRif which will evaluate pharmacokinetics and safety or increased We use a multi-pronged approach doses of rifampicin in HIV-negative

> Wits RHI is rolling out Africa's largest and health systems programme supporting the evaluation and rollout of HIV self-testing, which if successful could represent a major breakthrough in

As a result of our successful work on the HIV a United Nations Population Fund Self-Testing Assessments and Research (HSTAR) Programme, we were selected as one of the key implementing partners on the HIV STAR II project.

> This is the world's largest programme of its kind to fight the HIV epidemic in South Africa.

> HSTAR will support the government's goal to close the HIV testing gap by creating easier access to testing for hard-to-reach populations, with the ultimate aim of increasing the uptake of HIV prevention and treatment services.

The HIV Self-Testing Africa (HSTAR) initiative will be distributing more than two million self-testing HIV kits across South Africa. This drug resistance than standard HIV drugs is the world's largest programme of its kind to fight the HIV epidemic in the country.

In an effort to stem this growing tide of Wits RHI senior staff supported the high infection rates, Wits RHI secured a very large grant to rollout ARVs for prevention to young women (PrEP) in partnership with the NDoH. This forms part of a sexual and reproductive SRH: Within the field of SRH. Wits RHI health access project which is funded continues to contribute significantly on a by UNITAID international an organisation that invests in new ways implementation, to prevent, diagnose and treat HIV.

This project will help to fill a gap in the global evidence base for how real-life PrEP delivery can be carried out in the context of comprehensive health services for adolescent girls and young women. . This project will provide PrEP to 6,640 adolescent girls and young women aged 15 to 24 in priority areas of South Africa. The three-year project will be integrated into the National Staff at the institute have advised on the Department of Health's She Conquers campaign, which works with adolescent women and young girls to reduce HIV gender-based incidence, violence, teenage pregnancy, school drop-out rates and youth unemployment, with a In 2017, Wits RHI expanded several projects focus on prioritized districts.

Wits RHI continued to grow its footprint in the development of new technologies for HIV prevention, including PrEP. We began implementing the HPTN 084 study, which will evaluate the safety and efficacy of the injectable agent, cabotegravir (CAB LA) compared to daily oral tenofovir disoproxil fumarate/ emtricitabine (TDF/FTC), for pre-exposure prophylaxis (PrEP) in HIV-uninfected women. The research at Wits RHI also contributed to the application for licensure of the world's first ARV vaginal ring for prevention. monthly dapivirine ring has the potential to be a powerful tool in the fight against HIV.

As the first long-acting HIV prevention product designed specifically for women, it will enable more protect women to HIV transmission without against requiring action from a partner.

It is also the first in a line of new ring under development products that will greatly increase the options available for women seeking HIV prevention, contraception. products that offer dual protection.

In 2017, Wits RHI made significant contributions to the development of Key national, regional and global health consultations on the development of new policies and guidelines.

development of NDoH Dolutegravir guidelines, PrEP guidelines and Adult HIV Treatment National Guidelines.

alobal level. In its third year of the ECHO study reached its recruitment target of 7800

Aimed at comparing the risk of HIV acquisition in women randomized to either the Depo-Provera injection, Jadelle implant or the copper IUD, this study will provide important and potentially definitive data to address this question.

development of a trial to evaluate a new antibiotic for treatment of gonorrhoea in response to the emerging threat of antimicrobial resistance.

aimed at preventing violence against women and girls, including **EMPOWER** a study aimed at evaluating the inclusion of gender-based violence reduction activities within HIV prevention programmes.

The Institute also received CDC funding to implement the Bavikele project to of child raise awareness sexual in communities and abuse strenathen the management of child sexual abuse cases and the linkage to care. The Institute provided support, technical assistance and capacity building to ensure evidence-based policy change for the improvement of health outcomes.

Wits RHI staff engaged with national policy makers on the National STI Strategy and 2017 2022. Guidelines to Comprehensive STI Clinical Management Guidelines and the Sexual Assault Policy themselves and guidelines.

> VPD: Staff contributed to significant policy guidance on existing vaccines (yellow fever, rubella, polio, measles, and HPV) as well as on the committees evaluating the use of these vaccines in pregnancy, or advised on the development of new and vaccines for infections including Ebola, HSV, RSV, and other priority vaccine preventable pathogens.

> > global staff participated in vaccines including a vaccines for herpes

simplex virus, a virus that affects an estimated 470 million sexually active adults globally, one third of them in Africa, and is associated with increased HIV transmission and poor pregnancy outcomes.

Wits RHI extended its work on SRH and the interface with vaccine preventable diseases by initiating a phase 3 study to determine the immunogenicity and safety of a Respiratory Syncytial Virus (RSV) F Nanoparticle vaccine with aluminium in healthy third-trimester pregnant women (RSV-M-301).

African Local Initiative Vaccinology (ALIVE) has secured new funding and will support capacity development for vaccine expertise in the region.

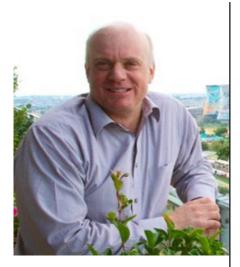
Income and sustainability: In 2017, Wits RHI had 62 grants totalling over R452m under management, of which 40 are for research. Furthermore, 40% of grants are investigator driven.

Publications: In 2017 Wits RHI had 38 jointly appointed staff, 25 who can be classified as research active staff. Staff contributed to 107 manuscripts and 65 conference abstracts were accepted for presentation as oral or poster presentations at international and national conferences. Wits RHI has a growing postgraduate support programme with 16 PhD students affiliated to it.

Awards: Wits RHI staff received several accolades including Professor Helen Rees who received University of the Witwatersrand's Faculty of Health Sciences Award in Recognition of Dedication and Achievement Research.

Dr Candice Fick was awarded the Dhiroo Mohanlal Prize in Paediatrics and Emerging Public Health Practitioner's Award. Drs Nomathemba Chandiwana Nonthuthuko and Mvundla were nomintated to represent South Africa at the 7th Inter-academy Partnership for Health Young Physician Leaders Programme in Berlin.





Professor Neil Martinson
Executive Director of the Wits
Perinatal HIV Research Unit

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Wits Perinatal HIV Research Institute

The Perinatal HIV Research Unit (PHRU), improves life through research. PHRU's research scope spans HIV and TB prevention and treatment and has an emerging focus on mental and cognitive disorders, cancer and diabetes.

Who we are: PHRU is a large clinical research unit with capacity to conduct a range of observational and clinical trial studies in multiple research sites across South Africa.

Although our primary research site remains Soweto after 23 years. We also conduct clinical and community research in Gauteng, Limpopo, North West and Free State, provinces where we are growing capacity.

Our **External Mission** is to conduct community-partnered, ethical, innovative and multi-disciplinary research that influences knowledge and policy.

Our **Internal Mission** is to develop passionate, caring and empowered researchers to work in the health development sector.

Research in 2017: In 2017 PHRU researchers were authors on 55 publications in international, peer- reviewed journals. Researchers at PHRU were awarded several new, large, competitive, research grants and continued to apply for others.

Our vaccine research has been particularly successful and in 2017 PHRU recruited participants into several critically important HIV and TB vaccine trials at Chris Hani Baragwanath Academic Hospital in Soweto and in Kliptown, 5 km away. Moreover, PHRU investigators occupy key leadership positions in the international HIV vaccine research field.

PHRU disseminated important research findings at the IAS 2017 in Paris. Firstly, Dr Avy Violari gave an oral presentation describing the "South African Child", an eight-and-a-half-year-old who had evidence of HIV infection at birth and almost immediately was started on antiretroviral therapy which a year later was interrupted as part of a clinical trial.

The child, eight years later was in remission – without any replicating HIV detected.

Secondly, we reported the usefulness of universal laboratory testing for TB in HIV-infected pregnant women, showing a yield of almost tenfold when compared to symptom based TB testing. This strategy is being considered for country-wide roll-out.

Our key funders: 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.

PHRU has successfully conducted several large implementation science studies based in communities and clinics in various settings, assessing strategies to improve diagnosis of TB, uptake of preventive treatment against TB and household contact tracing for family members of patients with TB.

In addition to numerous investigatordriven and publicly-funded clinical trials, PHRU also conducts clinical trials for pharma. PHRU has established important behavioural and social science research. We continue to advocate for research access and the provision of care to key communities.

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.

PHRU recruited or followed up participants in approximately 45 active studies, including its clinical research sites across 4 provinces. These studies include a diverse range of participants; pregnant women, HIV-infected children, HIV exposed uninfected adolescents and adults – both HIV infected and HIV seronegative.

New Research Themes: In 2017 PHRU applied for several mental health grants assessing cognitive deficits in adolescents on long term antiretrovirals, the prevalence of depression and anxiety in adolescents on ART and its impact on adherence.

PHRU is also closely collaborating with cancer treatment centres at Chris Hani Baragwanath Academic Hospital and Tshepong Hospital to diagnose and treat HIV-related lymphoma earlier. In 2017, PHRU researchers successfully applied for a grant to assess screening for diabetes in TB patients.

Mentorships in 2017: In 2017 we actively supported both undergraduate and post graduate emerging researchers. PHRU hosted or supervised:

- 5 PhD candidates (2 graduated)
- 6 Masters students
- 7 National Research

Staffing in 2017: In 2017 PHRU remained a growing research unit with 433 employees on staff. The PHRU team is led by Prof Neil Martinson.





Professor Ian SanneDivision Head of CHRU and HE²RO

CHRU:

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HE²RO:

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Email: info@chru.co.za

Web: www.chru.co.za

Web: www.heroza.org

Wits 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 health CHRU is based economics research, services and support. and in Johannesburg at the Helen Joseph Hospital 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 Witwatersrand's Faculty of Health Sciences.

recognised As internationally research and technical assistance units, **CHRU** and HE²RO clinical, epidemiologic health economic research and services. The units also ensures that research information is invested at operational level for the prevention, treatment and management of HIV and associated diseases.

Where we operate: CHRU is located adjacent to the Themba Lethu Clinic in the Helen Joseph Hospital and the HE2RO office is in Parktown.

2017 CHRU Synopsis and Highlights: The Clinical HIV Research Unit has been involved in several National Institute of Health (NIH) funded trials through the AIDS Clinical Trials Group (ACTG). The key areas of research are:

Drug sensitive and drug resistant Tuberculosis (TB) trial, drug resistant HIV trials, Kaposi Sarcoma and Cervical Cancer studies and the reduction of cardiovascular risk in HIV positive individuals on ARV's.

Several abstracts from trials that CHRU had participated in were presented at the Conference on Retroviruses and Opportunistic Infections (CROI) 2018.

The results released on the 5th of March 2018 showed that the one month TB prophylaxis regimen was as effective as the nine month regimen in HIV positive individuals. This ultra-short prophylaxis course could play a major role in controlling HIV-related TB.

The primary analysis for the A5288 protocol (MULTI-OCTAVE) was presented at CROI 2018. This protocol provided third-line ARV treatment for participants failing second-line treatment based on real-time genotyping. It also gave investigators working in resource –limited areas the opportunity to understand the genotyping results.

This protocol showed that the use or genotyping testing to select third line regimens can result in the appropriate allocation of more costly ARV's to those patients with greater resistance.

The A5349 protocol (Rifapentine containing treatment shortening regimens for pulmonary TB clinical trial), is currently still enrolling participants.

However, the results of an analysis to evaluate the effect of high dose Rifapentine on Efavirenz (EFV) pharmokinetics was released. The data from this analysis provided preliminary support for co-administration of high dose Rifapentine with EFV containing ARV regimens.

The main study will continue to recruit participants in 2018.

In addition the CHRU conducted a global Participants were assigned (2:1) to Other research this year has addressed study STREAM 1, the global results were released in October 2017 at the World Lung Conference in Mexico. STREAM is a randomised controlled trial with a noninferiority design.

The control regimen is the locally used 2011 WHO recommended regimen in the The week 24 results were published in June co-morbidities like drug resistant TB. participating countries. The study regimen 2017 and was presented at the HIV is closely similar to the regimen used in Bangladesh with the exception that high dose moxifloxacin replaces high dose gatifloxacin.

- Control regimen 80.6% favourable
- 9-month regimen 78.1% favourable
- Adjusted difference 2.1% (95% CI -6.9%, +11.2%), i.e. failed formally demonstrate non-inferiority.
- Control arm performed better than expected; likely to be due in part to choice of trial centres, patient selection and trial setting
- 9-month regimen performed well, similar to the cohorts, despite stricter criteria and longer follow-up
- There was no difference between treatment arms in severe (grade 3-5) adverse events (45.7% vs 44.7%), our primary safety outcome.
- There was no statistically significant difference in mortality between arms, although more deaths were observed on the study arm (8.5% vs 6.4%), particularly in those HIV co-infected (17.5% vs 8.0%).
- There was more QT prolongation in the study arm, with events of QTcF ≥500ms (on automated measurement) occurring throughout treatment.
- ALT laboratory abnormalities were more common in the study arm, but this didn't appear to translate into significantly more clinically important hepatic events. Further analyses of the safety data are ongoing.

CHRU completed also the MK 0518-292 study in 2017. ONCEMRK is a phase 3, multicenter, double-blind, non-inferiority trial comparina raltegravir 1200mg QD to raltegravir 400mg BID in treatment-naïve HIV-1infected adults.

at IAS 2017.

Glasgow conference in 2016 Oct or Nov. SLATE: Completion of enrollment in the At Week 96, HIV-1 RNA <40 copies/mL was SLATE I trial. SLATE is testing a simplified bv 81.5% (433/531) achieved participants who received raltegravir 1200 initiation of antiretroviral therapy for HIV, ma QD and by 80.1% (213/266) of those who received raltegravir 400 mg BID The (Figure 2).

The treatment difference was 1.4% with an without reasons for associated 95% CI of (-4.4, 7.3), hundred patients were enrolled from demonstrating non-inferiority of raltegravir three primary health clinics in Gauteng 1200 mg QD to raltegravir 400 mg BID.

Other virologic outcomes comparable between the treatment II, which will further simplify the algorithm groups.

HE²RO continued to grow its projects in 2017 in South Africa and neighbouring **ENHANCE**: Data collection for countries.

grants for research projects associated studies underway. Highlights of the year included:

INROADS (Innovations Research on period. HIV/AIDS) given a no cost extension. Due to the continued productivity and success of this award USAID provided a no cost extension to the original five year award.

The award now runs until December 2018 - 6.25 years in total. As result a number of new studies have been added to the research agenda.

During this year a number of publications have been produced under this award which have continued to inform and shape HIV policy in South Africa.

particular, research and tools developed under this award were used to support the costing of the National Strategic Plan for HIV, TB and STIs 2017-2022 (March 2017), which is the blueprint for the HIV response in South Africa.

raltegravir 2x600mg QD or 400mg BID, the rapid changes in the local and both with emtricitabine and tenofovir international guidelines around HIV care disoproxil fumarate (FTC/TDF) for 96 weeks. and treatment, in particular the move to Results from the week 96 analysis was "treat all", the increasing cohort of published Jan 2018 as well as presented patients requiring second and third line treatment, how to reach the UNAIDS goals of 90-90-90, and the complexities of

of algorithm for immediate (same-day)

algorithm is nurse-administered and does not require any laboratory test results prior to initiation in patients delay. Province and preliminary data analysis completed. SLATE I also laid the were groundwork for a follow-on trial, SLATE and allow a larger proportion of patients to qualify for same-day initiation.

evaluation of the National Adherence Guidelines for Chronic Diseases in South By the end of the year, HE²RO had 12 Africa was completed at the end of 2017 and and data analysis is underway.

> A total of 7943 patients were enrolled into the study and followed for the study

> Analysis of impact on short-term endpoints showed that the adherence guideline fast track initiation counselling intervention had some modest impact on initiation within 30 days at intervention sites; that adherence clubs showed some benefit in terms of increasing the proportion of patients who picked up their medication; and that enhanced adherence counselling had some benefit among those who got a repeat viral load test within 3 months.

> It will be important now to see if these early gains translate to improved retention and viral suppression as we impact on long-term analyse the outcomes.

Posters from the evaluation were presented at the 2017 South African AIDS conference in Durban; at the 2017 IAS conference in Paris; and the 2018 CROI conference in Boston.

Reports exploring patient and provider perspectives on differentiated care models based on data collected as part of the evaluation have been written and are available on the World Bank publication repository along with the report of the impact of differentiated care models on short-term indicators for HIV patients.

The protocol for the evaluation is described and published in BMJ Open and three manuscripts reporting the impact on short-term indicators have been submitted to journals for review.

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. The network is now being implemented by partners in Zambia.

This work was presented as a poster at CROI 2018 in Boston, and the final report was disseminated to the Ministry of Health in Zambia.

Postpartum Linkage to Care: The trial of a telephonic tracing and counselling support intervention to improve postpartum linkage to care begun participant enrolment in October 2016.

To date the study has enrolled 460 HIV negative and 714 HIV positive mothers as well as their babies from four midwife obstetric units in the Gauteng Province.

One manuscript describing predictors of early attendance of antenatal care services has been submitted for publication in the AIDS Patient Care and STDs journal and an abstract describing postpartum depression by HIV status was awarded the Best Abstract prize in the category of Epidemiology and Prevention Science at the ICASA 2017 conference.

Other Highlights: HE2RO was Invited by the World Health Organization (WHO) to participate in the consultation to develop a National TB Patient Cost Survey Handbook. Full handbook available at http://apps.who.int/iris/bitstream/10665/259701/1/9789241513524-eng.pdf?ua=1

Denise Evans was a recipient of a NRF COMPETITIVE SUPPORT FOR UNRATED RESEARCHERS (CSUR) grant for the project "SN-METRIC: Social Networks and Molecular Epidemiology of TB Transmission Clusters".

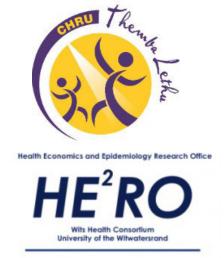
Publications in 2017: CHRU and HE²RO actively published research in leading journals. Together the two organisations published 66 articles during 2017.

Mentorships in 2017: HE²RO continued to attract quality post graduate students. In the year under review, eight Masters students and four PhD students continued with their degrees, with ongoing supervision from senior staff.

CHRU mentored one Masters and one PhD student.

Grants submitted and pending in 2017: In 2017 CHRU generated an income in excess of one and one hundred million rand with just under 20 international research projects.

The total income for HE²RO exceeded sixty eight million rand which focused on over 15 international research projects.





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Wits Maternal, Adolescent and Child Health Systems

The Wits Maternal, Adolescent and Child Health (MatCH) division is committed 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.

and Child Health (MatCH) is a South extensive experience and technical donor-funded based in Durban in KwaZulu-Natal. We quality HIV service delivery, innovating are a division of the Wits Health new approaches to service delivery, Consortium, affiliated to the School of scaling viral load technology and Public Health.

MatCH has extensive experience in public health, primary health care and largescale health service delivery in resourceconstrained, 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 interventions. 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 South Beach, Mayville and at the KwaZulu-Natal Children's Hospital.

We also have offices in Mkuze in Umkhanyakude district. Some of our staff are based at eThekwini district and municipality offices: and at the Provincial Department of Health in Pietermaritzburg. MatCH also has project staff in Harry Gwala district in KwaZulu-Natal.

we continued with our international expansion under the EQUIP project and have offices in Port au Prince in Haiti, and Accra in Ghana.

Who we are: Maternal, Adolescent EQUIP is a consortium of partners with organization expertise providing comprehensive highanalysing 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

> 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 Community Health Worker programmes.

> Staffing in 2017: We have a multidisciplinary 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 600 people, with 17 staff actively involved in research.

> Programmes in 2017: In 2017 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.

Tanzania and Dominican Republic and Programmatic innovative models of ART service delivery System in South Africa. and differentiated models of care.

PEPFAR grant, funded via USAID to five-year strengthen responses for improved HIV KwaZulu-Natal.

MatCH's adolescent, girls and young Research activities in 2017: Maternal, newdistricts in KwaZulu-Natal.

ELMA **Philanthropies** funded Unfinished Business project in eThekwini He has been at the forefront of this field of and Umkhanyakude districts focused on adolescents and children is also ongoing.

continued to participate important forums such as the National DOH Task Force for STI, HIV and AIDS Numerous research activities and positive Prevention, the National Research Committee, WHO Strategic including the following: and Technical Advisory Committee and the KZN Children's Hospital Steering Committee.

MatCH continued to conduct in-site and in-service training on a wide range of HIV. 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, pharmacy nutrition. and 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. Training is planned and scheduled with the Department of Health.

MatCH is a lead partner for the USAID- MatCH is in the second year of a five-year funded EQUIP project in Haiti, Ghana, U.S. Centers for Disease Control grant for Implementation supports USAID Missions, governments Technical Assistance (TA) for HIV/AIDS and and PEPFAR implementing partners to Tuberculosis (TB) Prevention, Care, and rapidly scale-up UTT through advising on Treatment Services throughout the Health

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

women portfolio included DREAMS born and child health research, including funding in 2017 for facility level HIV and infant feeding, is a key focus area interventions in two high prevalence of our work, led by Professor Jerry Coovadia, who is the Director of Health Systems at MatCH.

work for many years. He is also actively addressing the treatment needs of involved in the development of WHO and National standards, and implementation in South Africa of breastfeeding policies, which have had a positive impact on child health.

Health outcomes were achieved in 2017,

• MatCH continued to implement a WHO/South African National Department of Health Pregnancy Reaistry 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.

data 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

• To routinely provide information and evidence to policy-makers, health providers and stakeholders on the association between maternal health indicators. antenatal care indicators and the use of specific medicines during pregnancy.





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MRU (MatCH 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, 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 work: 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.

Research publications in 2017: In 2017, MRU published 10 articles in peer-reviewed journals from a wide range of projects including a sex worker health service intervention, a national female condom programme evaluation, a safer conception project, and formative research to understand perceptions of quality of care and barriers and enablers to accessing family planning methods and services.

Other publications focused on our core research areas including contraception, HIV prevention, safer conception and other areas of sexual and reproductive health.

Grant awards in 2017: In the year under review, MRU successfully applied for and was awarded several grants through collaborations and self-initiated grant applications of which one was an NIH application.

Research in 2017: In the year under review, we continued our core research areas including contraception, HIV prevention, safer conception, menstrual management, post partum depression and other areas of sexual and reproductive health. MRU engaged in pivotal research conducted with vulnerable populations, including youth, sex workers and recreational ARV users.

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 Harvard University and 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 pre-exposure prophylaxis (PrEP) and treatment as prevention (TasP), and other prevention options.

We completed recruitment 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.

During 2017, 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 sociobehavioural data collection is also underway to collect information around adherence in microbicide trials.

The National SA Female Condom (FC) Evaluation project, funded by USAID, completed its dissemination phase. This evaluation was a comprehensive mixedmethod study to identify strategies to enhance the FC's acceptability, and strengthen the national FC programme's effectiveness and efficiency.

The project was published as a Chapter of the 2017 South African Health Review: Twenty years of the female condom programme in South Africa: past, present and future. We also continued our research programme around testing the performance, integrity and acceptability of new female condom prototypes.

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 planning for a new 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 2017: 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, Professor Smit and Dr Beksinska provided editorial and technical support to start the process of the revision of the KZN Contraceptive Strategy. We also worked with the Department to design a study that aims 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 2017: MRU played a highprofile role at the South African AIDS conference held in Durban in June 2017 with MRU presenting over 10 posters and orals.

A number of staff successfully applied for and were awarded bursaries to attend. Prof Jenni Smit and Dr Mags Beksinska presented the National South African Female Condom Evaluation at the International AIDS Society (IAS) Conference in Paris in July 2017.

Training and capacity building in 2017: MRU focused on capacity building and training of researchers locally, regionally and internationally during 2017.

MRU staff are supervising two PhD candidates (one in Uganda), and one Masters study.

During 2017, MRU hosted students from the University of British Columbia (Canada), from the University of Washington (US), Arizona State University (US), Harvard University (US), and from the University of KwaZulu-Natal in South Africa.





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 Global established in 1997, with an original research mandate to investigate pneumococcal diseases at the pharmacological levels.

Over time, the Unit has evolved to molecular epidemiology of associated with pneumonia and meninaitis. The Unit has established itself as a premier clinical vaccine trial facility training platform and has undertaken pivotal studies on the pneumococcal conjugate and rotavirus vaccines, which have helped inform the utilization of these vaccines in low-tomiddle-income countries.

Our mission: The VPD/RMPRU is at the which has reported the forefront of epidemiological, translational laboratory research in prevention of major vaccine preventable diseases causing severe disease and death in young children; i.e. pneumonia, diarrheal disease and neonatal sepsis. also Unit focuses on development and evaluation of vaccines taraeted at preanant women. aimed to protect the mother, her fetus and young infant preventable diseases.

Research in 2017: In the year under review, Prof Madhi and his colleagues published 83 journal articles, including multiple publications in the highestranking infectious diseases journals. The Research Chair was a senior author on most of these publications and much of the research which was based on The his supervision.

had 7 PhD graduations, together with a further 10 PhD students under supervision hospitalization. and 3 MSc students under supervision.

leadership: The **RMPRU** internationally recognized for the role it has played in the clinical development of life-saving vaccines such as the rotavirus molecular, epidemiological, clinical and vaccine and pneumococcal conjugate Furthermore, it has been at vaccine. the forefront of vaccine studies aimed at pregnant women, including reporting on include investigating the clinical and the first placebo- controlled randomized other trial of influenza vaccine in pregnant bacteria and respiratory viruses that are women in low- and middle-income settings. RMPRU has also country 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, of invasive GBS disease incidence globally. The unit also does important work on vaccines and their impact on Vaccine Preventable Diseases (VPDs).

Rotavirus Vaccine Studies: One of the major focuses of the Unit is the clinical development of the rotavirus vaccine. taraeted at the most common cause of diarrheal hospitalization and death in lowfrom vaccine middle-income-countries, which informed the WHO policy for the introduction of this vaccine into public immunization programs.

> This study also led to South Africa being the first country in Africa to introduce the rotavirus vaccine into its childhood public immunization program in 2009.

impact of rotavirus vaccine outputs of post-graduate students under introduction on diarrhea hospitalization has also been evaluated by RMPRU, which reported a 45% reduction in all-Students: During the 2017 period, the Unit cause diarrhea hospitalization and 75% rotavirus diarrhea reduction

the immunoaenicity and efficacy of this the Chair have established GBS to be vaccine in low-middle-income-countries an important contributing cause to not continues to be investigated; as well as only neonatal death, but also stillbirths clinical development of new generation in South African women. These studies rotavirus vaccines.

Pneumococcal Vaccine Studies: The Unit undertook pivotal studies on the clinical development of pneumococcal conjugate vaccine (PCV), targeted at the leading bacterial cause of pneumonia deaths, which informed WHO recommendation on the use of this low-to-middle-income vaccine countries.

This work culminated in South Africa becoming the first African country to introduce PCV into its public childhood immunization program in 2009.

Since then, the Unit has remained involved in assessing the public health impact of the infant PCV immunization Africa. program in children and adults; and have reported 40% reduction in all-cause The HDSS site will serve as a barometer pneumonia hospitalization in children, as in tracking the socio-economic factors reductions as in pneumococcal disease in children who were vaccinated and also an indirect protection among unvaccinated adults.

The Unit is now engaged in studies aimed at reducing the cost of this highly expensive vaccine, by investigating rationalized dosing schedules.

Group B streptococcus Studies: 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.

Furthermore, the first study of a trivalent GBS conjugate vaccine in pregnant women was also published by the Chair in Lancet Infectious Diseases in 2016.

Furthermore, factors which might affect Stillbirths & Infant Mortality: Studies by Grant funded research: will be important in informing the design aimed future vaccines immunization of pregnant women to improve their birth outcomes and prevent invasive disease in their young infants.

> Child Health & Mortality Prevention: The RMPRU has also embarked on improving our understanding on the specific causes of stillbirths and under-5 deaths in South Africa, through its the participation in multi-country CHAMPS (Child Health and Mortality Prevention Surveillance) program. This program includes establishing a nested Health Demographic Surveillance Site (HDSS) in Soweto, which will be the first of its kind in an urban area in South

invasive influencing the health of pregnant women and their children. Furthermore, the program will investigate both infacility and community deaths using minimal invasive tissue sampling (MITS) to ascertain the specific causes of death in children and stillbirths; which will help inform on what future research and interventions are required to assist Africa in achieving South Sustainable Development Goal of reducing under-5 mortality by 25 per 1000 live births by 2030, compared to the current mortality rate of 43 per 1000 live births.

> Capacity building in 2017: The Unit continues to attract talented academics and has supervised several key research initiatives.

> Grant awards in 2017: The Unit was the recipient of many grants during the year under review. Substantial grants came from the following foundations and organizations:

- Center for Disease Control and Prevention Foundation
- Bill and Melinda Gates Foundation
- European Research Council
- Medical Research Council SA (Newton Fund)
- National Institute of Health
- Emory University/Bill and Melinda Gates Foundation
- Imperial College of Science, Technology and Medicine/Bill and Melinda Gates Foundation
- Vanderbilt University
- · University of Colorado
- University College London
- European and Developing Countries Clinical Trial Partnership

Industry funded research:

- Pfizer Inc
- Serum Institute of India Limited
- Novavax Inc
- PATH Vaccine Solutions
- MedImmune
- Julius Clinical Research B.V.
- Biovac Institute
- Sanofi/Aventis Pasteur S.A
- Pfizer Inc New York
- MSD (Pty) Ltd
- GlaxoSmithKline South Africa (Pty) Ltd





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Wits Medical Entomology Research Group

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

Who we are: The Medical Entemology Prof Basil Brooke: Research Group is affiliated to the Wits Research Institute for Malaria. The team consists of over two dozen academics, specializing in areas such as pathology, tropical medicine, chemistry, pharmacology and clinical medicine. Our team is made up of leading researchers, professors and academic lecturers.

Capacity building in 2017: The unit had four post-doctoral fellows registered in the year under review, along with the following post-graduate students:

- Post-doctoral fellows: 3 fellows were hosted
- 12 PhD students
- 1 D-Tech
- 22 MSc students
- 1 MMed

Publications in 2017: 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 38 papers combined from Entomology (19), Parasitology (5), Pharmacology (3) and Epidemiology (11).

Awards & Recognition in 2017: Our Unit head, Prof Maureen Coetzee was awarded the following:

- Invited by Keystone Symposia to organise a symposium on Vectors, Pathogens and Disease, 10-15 September 2017, Durban.
- Member of the Malaria Policy Advisory Committee (MPAC) of the WHO Global Malaria Programme, 2016-2019, reporting to the Director-General, WHO.
- Chair, Expert Review Group on new generation bed nets for MPAC and the WHO Global Malaria Programme.

• WHO representative for the UNEP DDT Expert Group 2016-2019.

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:

Promoted to Research Professor

Prof Robyn van Zyl:

• Promoted to Full Professor.

Grant awards in 2017: 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, NHLS, FRC, NRF and the Claude Leon Foundation.

Major Research Units

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.
- Targeted IRS: in collaboration with Prof I. Kleinschmidt from the London School of Hygiene & Tropical Medicine, this project evaluated targeted indoor spraying for malaria vector control, in association with the Limpopo and Mpumalanga Provincial Malaria Control Programmes, 2015-2017.
- 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.
- Malaria vector surveillance techniques: sponsored by the MRC-SA to evaluate a series of active and passive surveillance methods for adult Anopheles mosquitoes in a malaria endemic district of Mpumalanga Province.

- 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 gametocytes 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 proteins 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 collaboration 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 intraerythrocytic 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 exposure 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 collaboration 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 activity 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 novel water-soluble carrier polymers bioreversibly connected to quinine and cisplatin, such that the conjugates obey superior pharmacokinetics relative to nonpolymeric 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 dynamics 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 antimalarial treatment in HIV-infected patients in a tertiary hospital setting in Soweto, South Africa.

D. Chemistry:

- Synthesis and characterization of spirooxindole derivatives as potential antimalarial agents.
- Synthesis of antiplasmodial spiroindolone 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.





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Medical Research Council / Wits Rural Public Health and Health Transitions Research Unit

The Medical Research Council / Wits Rural Public Health and Health Transitions Research Unit (Agincourt) aims to better understand the dynamics of health, population and social transitions in rural South and Southern Africa in order to mount a more effective public health, public sector and social response. We support advanced research training and develop systems to render data more widely available.

Who we are: The MRC/Wits Rural Public Research highlights in 2017: The Unit Unit (the MRC/Wits-Agincourt Unit) is located in rural northeast South Africa, supports a close to the Mozambique border.

The unit includes the Agincourt health and socio-demographic surveillance system (HDSS) as a longitudinal research platform established in 1992.

The role of academics: The unit is located in a remote rural setting, in a resource-constrained area with limited infrastructure in Mpumalanga, some 500 kilometers from the University of the 1.Longitudinal Health: Witwatersrand.

We have established a research centre comprising 250 staff, 31 vehicles and offices at 3 sites: at Tinstwalo Hospital in Acornhoek, at Agincourt Village and the Research Lab located adjacent to the local health care facility in Agincourt Village.

Given the scale of advanced population-based R&D, involved academics devote major time to complex field science and research management. This is vital generating necessary evidence and high-quality data.

Publications in 2017: During the year review, the MRC/Wits-Agincourt Unit produced 117 peer reviewed publications and 17 commentaries, of which 46 peer reviewed publications were in journals with an impact factor of >3.

Capacity building in 2017: During the year under review, two Masters students graduated, with a further 5 Masters students currently enrolled. In 2017, four PhD students graduated, with an additional 27 individuals currently enrolled.

Health and Health Transitions Research provides a critical, and world-leading, population-based research platform that programme of work to elucidate causal pathways and test interventions that address national priorities, but with a regional orientation.

> A life-course perspective serves as the framework for much of the Unit's research. This programme supports advanced research training and develops systems to render data more widely available.

Extending and harmonizing the SA health and sociodemographic surveillance systems: Championed by Professor Collinson, the South Department of Science and Technology has funded SAPRIN (South African Population Research Infrastructure of Network Health and Sociodemographic Surveillance Sites).

Providing R99 million over the first 3 years, the NRI seeks to harmonize data collection and methodology and then extend the existing 3 South African HDSS sites (Agincourt, Africa Health Research Institute and Dikgale) to an additional 4 sites (3 urban, 1 rural), providing greater representation of the country.

Migration, urbanization and health in a transitional setting: With colleagues from Brown University in the US, Professor Collinson received a National Institutes of Health 5-year grant. This study will examine how migration and urbanisation impact the health of populations.

PHIRST (prospective Household study of Influenza, RSV and other respiratory pathogens community burden and Transmission dynamics)

To estimate the community burden of This project serves as the flagship study influenza and Respiratory Syncytial Virus of the cognition work underway in (RSV), and to assess the transmission Agincourt. dynamics of influenza and RSV infections in the community.

Child **Adolescent** Health 2 **Development:**

Africa:

Koteka trial that concluded in 2015, this affordable, integrated public study aims to determine the sexual risk behavioural profile of their male partners.

This study will establish the HIV prevalence, viral load and ART of these male partners Sleep to better understand young women's actual and perceived HIV risk.

Piloting a complex community intervention older rural South Africans to improve adolescent health - The further Ntshembo (Hope) Trial

Sub-Saharan Africa has the fastest growing adolescent population. In addition to 4. Public Engagement: having high rates of underweight and early childhood of overweiaht and particularly among adolescent girls.

to adolescents (14-19 years) to improve health system. their nutritional status in rural South African villages, and to model the effectiveness of such an intervention.

Social determinants of HIV among young policy South African women

testing on uptake of testing among young a policy. women and their peers and partners.

3. Adult Health and Ageing:

Innovative language controlled tabletbased cognitive test

Building on results from the Health and Aging in Africa: Longitudinal Studies in an INDEPTH community (HAALSI) completed in 2015, and with funding from the National Institute of Aging (NIH, USA), this study tablet-based cognitive screening measures consumption practices across communities. relation to a more traditional psychometric battery of tests found in the Health Cognitive Ageing Project (HCAP).

characterisation Prevalence, response to chronic kidney disease in & an urban and rural setting in South Africa

This study will be the first in South Africa Understanding the risk profile of young to characterise the burden of chronic women's male partners in rural South kidney disease (CKD), develop an accurate method for estimating kidney function and investigate risk factors for CKD. It is Utilizing young women from the Swa intended that the findings will inform an architecture and population structure; policy for CKD within the broader research capacity; modify and develop framework of non-communicable disease tools to study African populations. (NCD).

This study aims to describe aspects of sleep duration and quality in a cohort of and to explore relationships between sleep duration, timing and quality and HIV status, ART and NCDs.

growth faltering, this Verbal Autopsy with Participatory Action population also has rapidly increasing Research (VAPAR): Developing a peopleobesity, centred research health systems methodology

This study is funded to pilot a complex The overall aim of this study is to expand intervention that introduces community the knowledge base by applying a base d adolescent- focused health workers people-centred health systems research (AHWs) to deliver a structured programme method in a process connected to the

> cost- Public engagement in priority setting for health active involvement of the public in the decision- making activities of health

The study will engage the public to involve Study to determine the impact of HIV self- those affected in the development of

A study of community engagement in Agincourt longitudinal health and sociodemographic research:

This 3-year study is investigating the multiple and complex effects of participating in longitudinal health and socio-demographic surveillance (HDSS) over more than two decades, on community members, community leaders and service providers in a rural South African community. assesses the validity of the novel Oxford community-based antibiotic access and

5. Multi-centre collaborative work:

ABACUS

and This study, part of an INDEPTH Network collaboration, is an observational study to compareAWI-GEN:(Africa Wits-INDEPTH GENomic studies of cardiovascular disease) multicenter study in 6 African HDSS sites/cohorts)

Expand genomic association studies; deepen understanding of genome health strengthen genomic and bioinformatics





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Empilweni Services and Research Unit

The Empilweni Services and Research Unit (ESRU) seeks to be a welcoming, nurturing, goal oriented organisation that generates and uses scientific evidence to improve levels of care and to make a difference in the lives of mothers, children and their families.

Who we are: The Empilweni Services and Research Unit (ESRU) is located at Rahima Moosa Mother and Child Hospital and is affiliated with the Department of Paediatrics and Child Health of the University of the Witwatersrand.

Our mission: To investigate and implement evidence-based best practice in health care by conducting world class, cutting edge research relevant to local conditions aimed optimising outcomes of women, children and families affected by infectious diseases in South Africa. We are committed to helping each other live!

Vision Statement: 'Working together towards discoveries for global impact for parents and children'.

Our staff: Our team comprises clinicians and scientists with expertise in child and maternal health. The team is led by Professor Ashraf Coovadia from the Department of Paediatrics and Child Health at the University of the Witwatersrand.

Publications in 2017: ESRU staff published extensively in the year under review, with 32 journal articles published. Sentinel articles were published in Lancet HIV and Lancet Global Health. Publications genres included: maternal and child health, infectious diseases. public health. gastroenterology and nutrition, epidemiology, physiotherapy, adolescent health, radiology and imaging science, and health professions education.

Capacity building in 2017: ESRU staff are actively involved in the teaching of undergraduate medical students as well as postgraduate teaching and supervision. Collectively ESR staff supervised 11 PhD students, 9 MMed students and 13 MSc students.

Donor funding in 2017: ESRU was fortunate to receive financial support from a range of donor organisations and foundations, including the following: Pepfar, National Institute of Child Health and Human Development, CDC and UNITAID, UNICEF, Canadian Institutes of Health Research, Pharma/MRA, IdEA collaboration and the Burnett Institute.

Clinical trials in 2017: CHANGES Study This study was conducted at two clinical sites in Johannesburg, South Africa: ESRU at the Perinatal HIV Research Unit (PHRU) at Chris Hani Baragwanath Hospital (PI: Dr. Avy Violari). Enrolment began at both sites on 20 May 2017.

At PHRU, a total of 246 children were enrolled. Enrolment at ESRU is projected to be complete by mid-2018.

In a cross-sectional study of 120 HIV-infected, 33 HIV-exposed uninfected, and 25 HIV-unexposed uninfected children from the CHANGES cohort, we analyzed two biomarkers of aging - telomere length and DNA methylation (DNAm) age.

Telomere length was determined using a multiplex quantitative PCR method. DNAm levels were measured using the Illumina 450K array and DNAm age was calculated. There was no evidence of accelerated biological aging by DNAm age in this cohort of early-treated HIV-infected children.

Absolute telomere length was shorter in both HIV-infected and HEU children compared to HUU children but did not differ between HIV-infected and HEU children. This work was presented at the International Conference on HIV and Aging in October 2017.

Aging in October 2017.

HIV TNA PCR testing of the children The were started on ART early in life and have remained on treatment long-term. Time to becoming TND was faster in the were recalled for further testing.

investigate bone composition in HIV- complicate interpretation. infected children at ESRU. Peripheral quantitative computed tomography Three consecutive papers around the examine volumetric bone density has birth and the subsequent diagnostic and been included in this component, treatment Muscle and Test is also being evaluated in this group. project of Dr Technau.

LEOPARD Study: The LEOPARD trial is a **leDEA** longitudinal cohort study and started (International enrolling in September 2013. HIV- Databases for the Evaluation analysed either on site using a point of paediatric ART initiation as well care PCR test, or sent to the National conducting cancer Health Laboratory Services for a HIV-positive populations. standard PCR. Since 2013 through until mid-2017, 75 birth-identified HIV-infected Visitect CD4 Point of Care: The infants were enrolled.

Observational Cohort) study were care test). presented in an oral presentation in Paris at the 9th edition of the HIV Pediatrics workshop.

Absolute telomere length was shorter in The presentation was awarded a prize Paediatric HIV Surveillance: New HIV both HIV-infected and HEU children for the best oral presentation at the compared to HUU children but did not conference. The analysis presented the differ between HIV-infected and HEU cohort divided into three groups children. This work was presented at the according to time of starting ART and International Conference on HIV and investigated the viral response through the first year of life.

significant only discernable enrolled in the CHANGES study difference between the age at starting evaluated the ability of XPERT HIV TNA ART and virological response was in time PCR to detect disease in children who to becoming target not detected (TND).

All children with a PCR negative result infants who started ART <48 hours compared to the other groups. Clinical and social factors have been associated As a component of our CHANGES study, with the timing of ART initiation as well as we also conducted a Bone Sub-Study to ongoing adherence and these factors

(pQCT) scans of the radius and tibia to theme of early infant HIV diagnosis at management physical exposed/infected neonates have been endurance using the Six Minute Walk published. This was part of the PhD

Collabortion: The **IeDFA** epidemiological exposed neonates are tested for HIV as AIDS) Southern Africa collaboration is soon as possible after birth. Samples are ongoing and exploring outcomes of surveillance

Visitect CD4 Point of Care study was completed in 2017 in collaboration Results from the LEOPARD (Latency and with the Burnet institute, Melbourne Early neOnatal Provision of Anti- Australia and further collaborative work Retroviral Drugs Clinical Trial and is planned for 2018 (Syphilis point of

and VLreports were developed e.g. National HIV PCR Birth report; HIV VL & CD4 Results for Action Reports, and the adult HIV Dashboard modified to display only 0-19 year olds. A Self Service Portal was launched that allows stakeholders to register and request reports online at www.nicd.ac.za - HIV Reporting.

We completed an investigation into the treatment cascade of newly diagnosed HIV-infected infants with longitudinal follow up of at least 13 months in uMkhanyakude and Tshwane.

Results demonstrated a decline in the HIV VL in neonates over 2010 to 2016 suggesting increasingly potent maternal PMTCT regimens. We also collaborated in the Road to Health Booklet unique identifier project to link birth PCR tests to later test records – the concept has now been rolled out in Gauteng.





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Wits Pathology and Clinical Laboratory Services

The Wits Pathology and Clinical Laboratory Services' (CLS's) vision is to be the leading provider of clinical pathology services globally.

Who we are: Located in Johannesburg, South Africa, Clinical Laboratory Services (CLS) is a division of the Wits Health Consortium (WHC), the research arm of the University of Witwatersrand. It is managed through the Department of Molecular Medicine and Haematology under the helm of Professor Wendy Stevens.

The unit leverages on the significant infrastructure of the department and its pathologists. It was established in July 2000 to support the teaching and research activities of the School of Pathology through the provision of laboratory services, diagnostic and research advice and data management support in accordance with the standards of Good Laboratory Clinical Practice (GCLP).

Its mission is to deliver expert clinical trial services through cutting-edge laboratory technology while promoting lasting relationships with clients and academia.

Our activities: CLS clinical activities can be divided into several areas as follows:

- Innovation research especially in laboratory diagnostic implementation
- Clinical trial research (Phase I to III), including grant funded projects and pharmaceutical drug/ treatment trials
- Training and capacity-building in the clinical laboratory setting in Africa
- Clinical research (non-trial academic research)
- Infectious disease prevalence testing
- Specialist diagnostic and monitoring testing for patients.

iLEAD: The innovation hub of CLS, iLEAD, was established in 2017, in collaboration with Professor Souleymane Mboup (Senegal) and Dr llesh Jani (Mozambique) with funding from the Bill and Melinda Gates Foundation to evaluate, develop and implement novel laboratory healthcare solutions for improvement of Public Health in Low and Middle-Income Countries (LMIC).

This innovation hub is integrally linked to the CLS platforms leveraging on the laboratory resources and implementation expertise.

A key allied project is the EQUIP (PEPFAR/ USAID funded) project which aims to provide laboratory infrastructure to support HIV and TB laboratory programmes in Africa and Asia. CLS has a long history of innovation in the fields of diagnostics and sample shipping and storage. In 2010, Professors Scott and Stevens developed a novel dried culture spot for quality assurance for molecular tuberculosis (TB) diagnostic testing.

This has been implemented in TB laboratories internationally and has won a number of awards including the Innovation Prize for Africa's Social Impact Award (2015), the GAP Biosciences Business Plan Award (2014) and the NHLS National Innovation award (2013). Smartspot has been developed into a spin-off company through the University of the Witwatersrand's private enterprise wing.

CLS has developed a number of diagnostic strategies specifically for under-resourced settings which it implemented across sub-Saharan Africa.

This included the first use of dried bloodspots for infant HIV, development of quality assurance panels for a number of supplications including for assurance of peripheral blood mononuclear cell (PBMC) isolation and for CD4+ T cell enumeration.

CLS has provided diagnostic support and storage to over 1000 clinical trials through a network of laboratories across the African continent. It has successfully participated as the laboratory partner in multiple NIH-funded trials. In addition, CLS provides support for studies in the fields of infectious disease research including in:

Human Immunodeficiency Virus/
Acquired Immunodeficiency Syndrome
research (Adult AIDS Clinical Trials
Group (ACTG), Paediatric AIDS Clinical
Trial Group (PACTG/IMPAACT), HVTN,
HPTN, Central HIV/AIDS Vaccine
Immunology (CHAVI), International HIV/
AIDS Vaccine Initiative (IAVI), CIPRA
(Comprehensive International Program
of Research on AIDS-South Africa),
EQUIP-AIDS

Mycobacterium tuberculosis (TB) research – Foundation for Innovative New Diagnostics, Newton UK/SA MRC, NIH (NIAID), Global Fund-ZAF-C-NDOH: EQUIP-AID-OAA-A-15-00070, Centers for Disease Control (Atlanta)

In addition to H3Africa samples, CLS manages a large repository of human samples on behalf of a number of collaborating clinical trial networks including CHAVI, IAVI, ACTG, PIP, MTN, and acts as the central repository for the **South African Cancer Epidemiological Research Group** which supports the National Institute of Occupational Health's Cancer registry.

It also stores approximately 100,000 CIPRA samples, which was a NIH-funded study active between 2002 and 2008 (Secure the Household) which provides ongoing sample distribution for investigators. The CLS repository has skilled staff with core expertise in biomaterials storage, peripheral blood mononuclear cell processing, logistics, sample and data management, quality assurance and training. PBMC isolation and training is provided regionally.

A comprehensive list of samples currently stored is included in Table 1. The biorepository has been expanded to allow for storage of the H3 Africa samples. This is a pan-African consortium looking at genotype-phenotype interactions and the role of the genotype in African disease.

The CLS biorepository has developed significant expertise in the arena of biorepository science and has a well-developed infrastructure with support for automated DNA and RNA extraction.





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Department of Molecular Medicine and Haematology

Department of Molecular Medicine and Haematology (DMMH) at the University of the Witwatersrand and the National Health Laboratory Service (NHLS), the largest haematology department in South Africa.

Who we are: The Department of Molecular Medicine and Haematology comprises a number of divisions which continue to support pathology diagnostics, high-quality research and teaching at an undergraduate and postgraduate level.

The department is the largest single haematology unit in the country and trains all cares Excellence in all 3 components is a function of the diversity of skills and commitment from staff members in a background innovation. The haematology division is the largest single training unit and is an acknowledged leader undergraduate and postgraduate education.

Several research units are attached to the department and include the HIV Pathogenesis Unit, the Antiviral Gene Therapy Research Unit and the Red Cell Membrane Unit. The department thus produces cutting-edge research as evidenced by the number of peerreviewed publications, conference presentations and the contributions to policy both locally and globally.

Each unit within the department contributes to the teaching outputs at various levels both at the NHLS and the University of the Witwatersrand. The department co-ordinates both the Molecular Medicine 2 and 3 courses for health professionals and co-coordinates the Bachelor of Engineering for biomedical engineers. High success rates reflects the departments dedication underaraduate education and the ongoing evaluation and review of these courses. At the post-graduate level, the department runs honours, masters and doctoral programmes and continues to show excellence in throughput.

The department supports research at all levels and across various fields. Professor Stevens personal research efforts have been focused in HIV, precision public health and implementation diagnostics for the past 15 years and this can be supported by over 250 peer reviewed publications in high-impact journals and as many conference presentations.

She has contributed significantly to the development of capacity for affordable, accessible HIV diagnosis and monitoring in South Africa and over 100 centres in sub-Saharan Africa.

Our Research Activities: Research activities have included the expansion of early infant diagnosis of HIV, affordable viral load testing and investigation of HIV drug resistance. In 2006, she received an award from the National department of Science and Technology for her contribution to the development of laboratory capacity in Southern Africa.

This work has only been possible due to the collective efforts of a group of very senior talented researchers.

In 2013/4, this team won the NHLS awards for innovation, service excellence and the Best NHLS laboratory. Since November 2010, Professor Stevens has been appointed head of National Priority Programs at the National Health Laboratory Service focusing on laboratory efforts related to HIV, TB and other opportunistic infections.

More recently her time has been spent planning and ensuring the implementation of the National GeneXpert Program (207 laboratories), including all quality assurance and connectivity solutions.

The verification and EQA panels using dried culture spots has resulted in several national innovation awards and in May 2015, the African Prize for innovation for the greatest social impact. This led to the only faculty of health Sciences spin-off company, Smartspot™. Her team has recently worked on expanding these programs to incorporate vulnerable populations such as the Correctional Services, peri-mining communities and children.

She is also involved in developing the National HIV drug resistance strategy, the National POCT policy, the Cervical Cancer implementation plan, strategies within the National TB and HIV Think-Tanks and the antimicrobial resistance strategy working group. This group receives significant funding from the Global fund, CDC, USAID, Bill and Melinda Gates foundation, MRC, NRF, amongst others. The group are intimately involved with expert opinion supporting policy development through organizations such as the WHO, CDC and ASLM.

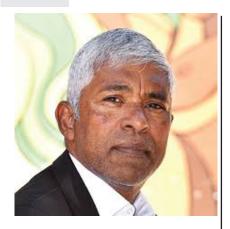
Our Grants: There are approximately 78 grants located within the department of varying sizes across different donors. The majority of these grants are managed wholly by the Wits Health Consortium who provide administrative assistance. Professor Stevens was one of the four founding members of the organization and has worked in different capacities over the last 15 years within it. The department has high profile researchers generate an extraordinary amount of research and contribute not only to major grant income but conduct important public health research and policy.

Publications: The department generated over 60 publications over the 2017-18 year in high impact journals. In addition, the group provides significant laboratory support for other major syndicates under the WHC banner including Right to Care, WHRI, PHRU through which joint programs are solicited and implemented. A notable one being the large Equip grant (USAID funded) which is providing support for viral load scale up in over 17 countries.

In addition, the department focuses on expanding facility for collaborative research through the activities of CLS which includes the development of sequencing and biorepository services, state-of-the-art diagnostics for communicable and non-communicable diseases while continuing to provide support for clinical trials.

Our Researchers: Leading departmental researchers including Drs Carmona and Mayne, Professors' Scott, Glencross, Mahlangu, Arbuthnot, Coetzer and Papathanasopoulos, to name a few key members. There is a strong focus on priority high burden diseases in South Africa and the region. The number of peer-reviewed publications from the department over the past 5 years exceeds 500.

In addition, this year an award was received from the BMGF to establish an African Innovation network with the Wits faculty of Health Sciences(through WHC), the hub through which activities and new programs are directed. The program is called iLead (Innovation: Laboratory Engineered Accelerated Diagnostics). This will be a flagship program within the region for driving a culture of innovation in the entire laboratory value chain, including the clinic-laboratory interface.



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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.

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 that have 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
 - o Smoking cessation
 - o Obesity
 - o Hypercholesterolemia
 - o 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

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 development projects.

Our key focus area is TIMS (TB in the Mining Sector in Southern Africa) but other priorities also include HIV, malaria, immunization, nutrition, information, behavioural change and social mobilisation, and Occupational Health and Safety.

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

The TIMS grant is funded by the Global Fund. This grant enables us to run the TIMS programme in order to reduce the TB burden in the mining sector in 10 southern African countries.

What we do: Our work is focused on having a positive impact on policy development. This includes the harmonisation 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. TIMS operates in 10 southern African countries including, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

In 2017 the TIMS programme:

- Screened over 300 000 people in the mining community for TB;
- Established 10 occupational health centres across the region;
- Completed four evidence generation studies;

- Built and tested three IT systems namely a Regional Health Management Information System, cross-border referral system and IT link to the compensation fund;
- Developed a comprehensive dust control toolkit and completed training in 8 countries across the region;
- Trained 20 Civil Society
 Organisations in advocacy work in 10 countries across the region.

These are just some of the successes achieved over a short two year period. This accelerated accomplishment lead to the grant securing funding for an additional 3 years.

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.

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

- Conducting a feasibility study for the Namibia Trauma and Rehabilitation Centre.
- Holding a dissemination workshop for the four studies that were outcomes of the TIMS grant.
- Providing Technical Assistance for the Design and Delivery of a Regional Technical Meeting of Experts on Pandemic Preparedness for the World Bank

- Conducting DPMT Smelter
 Occupational Health audit for the
 Ministry of Environment and Tourism in
 Namibia
- Attending the UNION Lung Conference in Mexico
- Submitting four abstracts to the World Conference on Lung Health.
- Co-hosting together with the World Bank the Smart Investment in health meeting

Future plans: Looking ahead, our core aims and targets include leveraging additional funding to support TIMS (from both donors and the private sector). We plan to expand development in our areas specialisation as well as packaging robust health sector consultancy offerinas.

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WITS
DEVELOPMENT
ENTERPRISE
DIVISION
. W D E D.



Batho Pele Breast Unit

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

For more information please visit our website: www.bathopelebreastunit.co.za or call (011)933 0341/8052/8804

Wits Enterprise

WITS Enterprise is a private company, owned by the University of the Witwatersrand, mandated to market and commercialise the University's intellectual capital. WITS Enterprise comprises four units, which each provide dedicated and strategic services that are aligned with the objective to optimise the University's impact on society. These include Innovation Support, Research Support, The Entrepreneurial Wayz and Short Courses. Wits Enterprise offices are situated in the PDH on East Campus.

For more information, please visit our website: www.wits-enterprise.co.za

Early Grade Reading Study II

The Early Grade Reading Study II is an expanded, randomized control trial of promising approaches to improving the teaching of reading in English as a First Additional Language.

Our focus is primarily on Grades 1 to 3 in disadvantaged schools. The EGRS II study is a collaboration between the Department of Basic Education and the University of the Witwatersrand.

EGRS II is currently being evaluated in 150 primary schools in two districts of Mpumalanga and will continue until 2019. Funding for this study has been provided by USAID.

Professor Brahm Fleisch, Education Director, is the Principal Investigator of the Early Grade Reading Study II.

For more information please telephone 011 717 3094 or email Brahm.Fleisch@wits.ac.za

WDGMC Transplant Unit

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 please visit our website: www.dgmc.co.za/highly-specialised-unit/transplant or telephone 011 356 6488.

The Rural Health Advocacy Project

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.

For more information please visit our website: www.rhap.org.za or telephone 010 601 7427

CBTBR

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.

WCR-Lipids

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 of WCR-Lipids 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 hypercholesterolaemia and other dyslipidaemias, insulin resistance, diabetes mellitus as well as other related metabolic disorders.

The Unit is well recognized both nationally and internationally its work on familial hypercholesterolaemia, 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 and PCSK9-inhibitor monoclonal antibody therapy, siRNA PCSK9-inhibitor therapy, Inclisiran, and more recently Angiopoetin-like 3 inhibition in this patient group.

For more information please call (011) 488 3538/643 2935



Message from CEO Mr Alfred Farrell

Wits Health Consortium (WHC) is an entity which is wholly owned by the University of Witswatersrand (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 a reputation 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

