

Nurturing future leaders in non-communicable disease research within the African continent

Since its inception six years ago, the Wits Non-Communicable Disease Research Leadership Programme has made excellent progress towards understanding the increase of cardiovascular and metabolic diseases among Africans. Thanks to the work of **Professors Michèle Ramsay, Nigel Crowther, Kerstin Klipstein-Grobusch and Karen Sliwa** at the University of the Witwatersrand, the programme has attracted researchers from all over Africa, who are contributing to the understanding of important diseases that continue to be a rising global health burden.

A GLOBAL HEALTH BURDEN

The most common NCDs worldwide are obesity, hypertension, heart disease, stroke, cancer, and diabetes. These diseases are often publicised as problems that are confined to high-income countries. However, according to the World Health Organization, 80% occur in low- and middle-income countries, where most of the world's population reside. The number of people in these countries with NCDs is rapidly increasing, driven by economic, lifestyle and cultural changes. In order to tackle this health issue, it is necessary first to understand how widespread the problem is and why it is happening. These are some of the questions that Professors Michèle Ramsay, Nigel Crowther, Kerstin Klipstein-Grobusch and Karen Sliwa from the University of the Witwatersrand, have set out to address through the Wits Non-Communicable Disease Research Leadership Programme.

The development of an integrated Research Training Programme in non-communicable diseases (NCDs) in low- and middle-income countries (LMICs) in Africa arose from the need to understand the nature, extent and pace of the epidemic of diseases of lifestyle on the continent. The Wits Non-Communicable Disease Research Leadership Programme began in January 2011. Funded by the National Institutes of

Health's Fogarty International Center (USA), the project is collaborative, spanning several research programmes at the University of the Witwatersrand in South Africa and beyond. It aims to increase research capacity through the development of high quality researchers at Masters, PhD and post-doctoral levels, whose work focuses on all aspects of NCDs, including chronic conditions such as obesity, type 2 diabetes, heart disease, stroke and hypertension.

The team hopes that the programme will eventually lead to affordable treatments and effective prevention and management strategies for NCDs. The programme addresses three main areas of investigation. Firstly, it aims to understand how widespread the problem of cardiovascular and metabolic diseases is in sub-Saharan Africa. Secondly, the underlying causes of these conditions are explored. The final aim is to use the research to produce tangible outcomes such as affordable and effective ways to intervene, thus preventing the current increase in disease burden. Overall, the researchers hope the results will contribute to the global understanding of chronic diseases exacerbated by poverty and harmful lifestyle choices.

FOSTERING FUTURE SCIENTISTS IN AFRICA

Propelled by the need for research leadership in Africa to address the severe paucity of data on NCDs on the continent, this programme has as its primary aim the nurturing of a network of future African leaders in the field. ▶

Students get a broad perspective on NCDs in Africa and knowledge around the mechanics of performing research in a resource-limited environment



Student presentations at the University of the Witwatersrand



Attendees at the NCD Symposium hosted at the Noguchi Memorial Institute for Medical Research in Accra, Ghana, in March 2017. The meeting theme was "Advancing Non-Communicable Disease Research in West Africa: Building cohorts for multidisciplinary research including genomic studies" and it was organised by two of the Wits NCD Leadership Training Program fellows, Dr Mary Amoakoh-Coleman (extreme left) and Dr Paulina Tindana (fourth from the right).

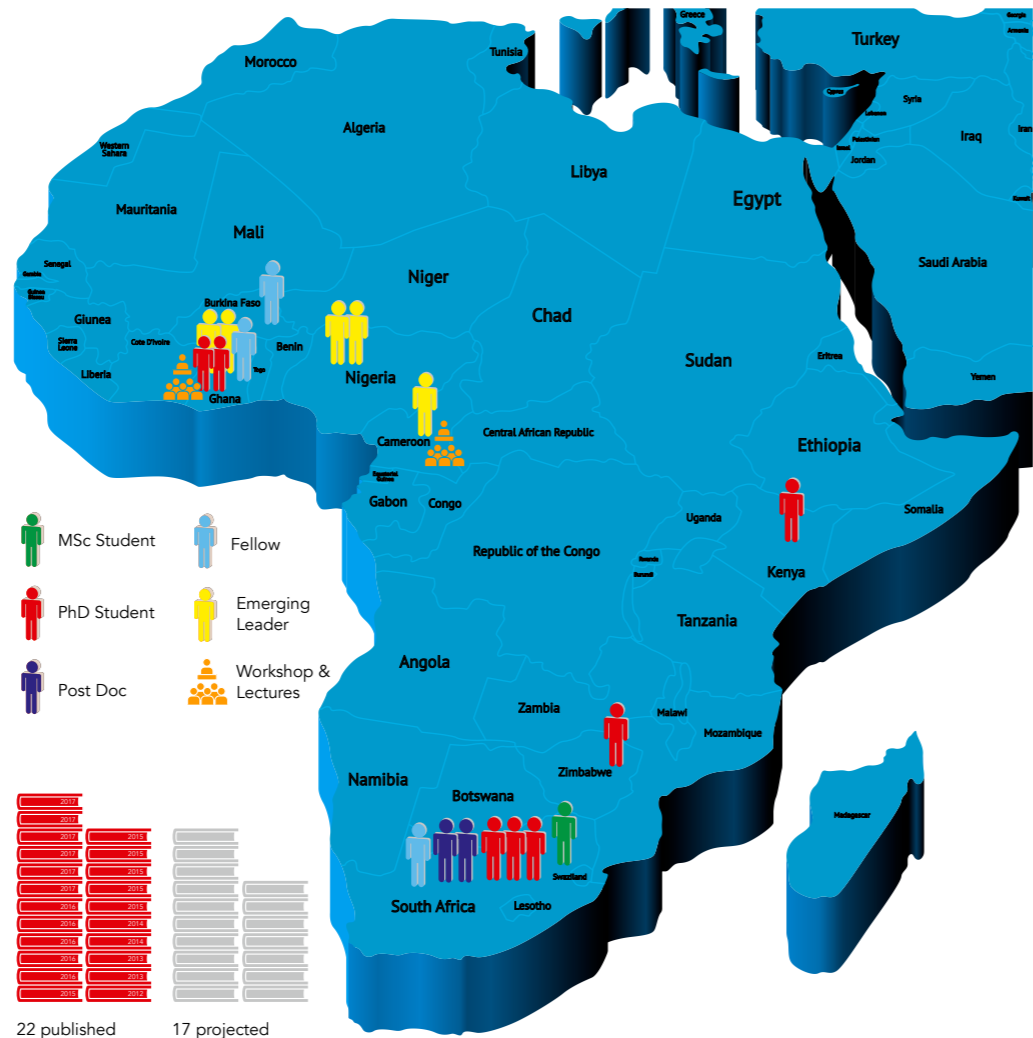


There is a need to develop cross-continental research to begin to understand how the highly diverse cultures and environments are shaping the health of their peoples. Of necessity, progress in the field will need an appreciation of the genetic diversity among Africans and how gene-environment interactions are shaping the landscape of common diseases.

The programme was designed to recruit researchers from all over Africa and to ensure that they received full funding to support their training. As part of the process, trainees are encouraged to enrol in short-, medium- and long-term interdisciplinary courses to strengthen the study of NCDs in Africa. Preference is given to candidates who anticipate remaining in their field of research after completing the programme and who aim to promote such research within the African scientific community. The programme supports emerging research leaders in their fields who showed leadership promise and provides funding for trainee-led workshops to reach a larger community of NCD researchers.

Since its inception, the programme has supported one MSc student, seven PhD students, two postdoctoral fellows, five emerging leaders and three additional fellows. Their joint work has resulted in 22 peer-reviewed publications to date with a further 17 projected to be published in the next two years (see infographic). In 2016 and 2017 the emerging scientists planned and led two workshops fostering NCD research networks in their regions, one in Ghana and one in Cameroon. These workshops were attended by academics, students, policy makers, government representatives and the media to create awareness of the rise in NCDs and the need to address the associated morbidity and invest in context-specific prevention programmes.

The University of the Witwatersrand is perfectly placed to offer this cross-disciplinary programme, with collaboration and co-funding between its established research entities including the Soweto Heart Study (SOCRU), the Agincourt Health and Demographic Surveillance Site (Wits/MRC Rural Public Health and Health Transitions Research Unit) and the Sydney Brenner Institute for Molecular Bioscience which hosts an H3Africa Collaborative Center. The programme also collaborates with local partners at the Hatter Institute for Cardiovascular Research in Africa, based at the University of Cape Town, and international



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partners based at Utrecht University, The Netherlands. This multidisciplinary training spans the fields of clinical medicine, genetics, epidemiology, health economics, public health and ethics. Through its diverse activities the programme aims to build Africa's next generation of leaders in NCD research.

TANGIBLE RESEARCH OUTPUTS

Some of the recent research that has come

out of the programme includes determining the economic cost to South Africa related to the burden of stroke, the genetic susceptibility of people of African origin to kidney disease associated with HIV infection and how a mutation in a specific gene causes macular corneal dystrophy in a South African family. One study found a host of genetic variants that contribute to body size and body mass index (BMI), a measure often used for obesity.

Q&A

Why did you decide to focus on non-communicable diseases in sub-Saharan Africa, and how many other research groups are doing a similar thing?

We focussed on NCDs because of the rising prevalence of these diseases and the known social, financial and health costs associated with poorly controlled cardiometabolic diseases. Also, with the roll out of anti-retroviral therapy, people with HIV are now living longer and are at high risk for NCDs. We are not aware of other research groups in Africa who are involved in leadership training in the field of NCDs.

The research programme has a very broad remit. How do you decide which diseases and topics will be suitable for each student?

The focus of the research projects is linked to the research interests of the four principal investigators involved in the programme, and these cover the prevalent NCDs found in sub-Saharan Africa and range from epidemiological, health economic, and nutrition to molecular and clinical research projects. We believe that students thrive on projects that ignite their curiosity and try to match the projects to the student's interests and skills.

What kind of inter-disciplinary training courses are the students required to undertake during the research, and how does this help the programme?

Students are provided with courses ranging from epidemiology of NCDs in Africa, to leadership training, grant writing, statistics and ethics. We are fortunate that the Faculty of Health Sciences at Wits offers these courses regularly. They give the students a broader perspective on NCDs in Africa and knowledge around the mechanics of performing research in a resource-limited environment. It is important to develop a wide skill-set among future leaders.

What do you consider as successes of the programme?

Besides the usual things like higher degrees, peer-reviewed publications and new knowledge, we are most encouraged when trainees find employment in areas where they can influence the NCD research agenda, especially in their African countries of origin. We hope to see them in leadership positions in the future – that would show that we made a difference!

Detail

RESEARCH OBJECTIVES

The Wits NCD Research Leadership Programme focuses on cardiovascular and metabolic diseases. The aim is to understand their prevalence in sub-Saharan Africa, provide an impetus to monitor and uncover the underlying causes, and to develop effective intervention programmes.

FUNDING

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COLLABORATORS

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Another looked into the relationship between sleeping patterns, obesity and blood pressure, and demonstrated that in females longer night time sleep duration was associated with lower BMI but higher blood pressure. Some of the latest work by alumni is focusing on how to initiate prevention of NCDs at an early age, through education programmes that increase awareness of the risk factors for these diseases and to integrate chronic care for both communicable and non-communicable diseases.

A dynamic, cross-disciplinary training initiative, The Wits Non-Communicable Disease Research Leadership Programme is nurturing future leaders in NCD research within the African continent. If you would like to find out more about the training programme please visit the website <http://www.ncdleadershiptraining.org/>



Professor Nigel Crowther

Research Professor in the Department of Chemical Pathology, National Health Laboratory Service and University of the Witwatersrand. His interests include adipocyte biology, obesity and disease, early-life aetiology of cardiometabolic diseases, genetics of obesity and effects of HIV on metabolic function.



Professor Kerstin Klipstein-Grobusch

Associate Professor of Global Health at the University Medical Center Utrecht, and Visiting Professor at the School of Public Health, University of the Witwatersrand. Her interests include cardiometabolic disease in general and in HIV-infected populations and research capacity building in epidemiology and public health.



Professor Michèle Ramsay

Director of the Sydney Brenner Institute for Molecular Bioscience and Professor in the Division of Human Genetics, University of the Witwatersrand. Her research explores the genetic variation in health and disease in Africans. A Research Chair in Genomics and Bioinformatics of African populations, she is also President of African Society of Human Genetics.



Professor Karen Sliwa

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