



MATERNAL AND NEONATAL HEALTH RESEARCH NEWSLETTER

Projects | Talks | Visits | Publications | Funding | Collaborations

About this newsletter

The focus of this newsletter is on Maternal & Neonatal Health Research (MNHR) in Africa. It offers a platform to communicate and update on MNHR-related activities and will be published on a regular basis. This issue is the first in the series and reports on the main news items over the past year.

About the Centre

The Wellcome Trust-Cambridge Centre for Global Health Research (WT-CCGHR) uses the outstanding research capabilities and influence at Cambridge to support global health. This is achieved through co-ordinated cross-faculty research strengthening and scientific training activities, and collaborative research partnerships.

WT-CCGHR and Cambridge-Africa

WT-CCGHR and Cambridge-Africa work together to make the world-class expertise and facilities available at the University of Cambridge to support African researchers working in Africa to combat major killing and debilitating diseases (continued on p.5).



WT-CCGHR support for an African Centre of Excellence for Pregnancy and Childbirth

The Centre's research on maternal and neonatal health is building on existing collaborations. Partners include the University of Cambridge, affiliated research institutes such as the Wellcome Trust Sanger Institute, and Cambridge University Hospitals (CUH) in collaboration with Makerere University and Mulago Hospital. The research infrastructure already in place at Mulago Hospital and Makerere University makes it an excellent candidate for the establishment of an African maternal-fetal research centre of international standing. The Centre aims to set up an African Centre of Excellence in Pregnancy and Childbirth at Mulago Hospital in Uganda, where 32,000 babies are delivered each year. The collaboration draws on Cambridge's world-class expertise on maternal and neonatal health.





Professor Ashley Moffett joins WT-CCGHR

Ashley Moffett, Professor of Immunology at the Department of Pathology in Cambridge and a key researcher at the Cambridge Centre for Trophoblast Research, joined the WT-CCGHR in 2015 to lead the Maternal and Neonatal Health Research theme. Professor Moffett is instrumental in developing multiple current and potential future research links between Cambridge and Makerere University, Mulago Hospital, and the Uganda Virus Research Institute (UVRI).

"It makes scientific and economic sense to investigate pregnancy disorders in a setting where they have such a major impact on maternal and neonatal mortality."
Professor Ashley Moffett

Pregnancy disorders, particularly pre-eclampsia, are responsible for the enormously high maternal mortality rate in Africa. More African populations need to be studied so as to quicken the discovery of the key susceptibility and protective genes for pre-eclampsia since Africa has great genetic diversity, less linkage equilibrium and a high disease burden.

Why Maternal and Neonatal Health Research in Africa Matters

Many basic assumptions rely on information gathered in the developed world, rather than in the many distinctive and diverse African cultural, environmental and genetic settings. It is vital to address the major knowledge gaps about pregnancy in Africa, to provide effective life-saving interventions, but also contribute information of fundamental importance to women's health globally.

"The reasons for Africa's excessively high rates of maternal and neonatal death are neither adequately understood nor documented."



Professor David Dunne,
Director of WT-CCGHR and Cambridge-Africa Programme.

Failures of immunological maternal-fetal interactions cause major problems in pregnancy, including recurrent miscarriage, stillbirth, pre-eclampsia and low birth weight. Babies who have poor growth in utero have long term health problems extending into adult life.

The rates of mortality in childbirth for both mothers and babies are very high in sub-Saharan Africa (SSA) compared to elsewhere in the world. Evidence also suggests that pregnancy disorders that arise because of an underlying defect in

placentation in the first trimester (pre-eclampsia, stillbirth, preterm labour, fetal growth restriction) occur more commonly in African women even when they have emigrated to high-income countries.



Visits between Mulago Hospital/Makerere and Cambridge

With support from WT-CCGHR, Dr Jane MacDougall and Dr Charlotte Patient (obstetricians from the Rosie Hospital in Cambridge) and Professor Ashley Moffett visited Mulago in March 2015 to scope the feasibility of establishing a collaborative project with key partners in Uganda. A partnership focused on the four major causes of maternal mortality - sepsis, pre-eclampsia, haemorrhage and obstructed labour - was established. Research on each of these areas is led by a Mulago and a Cambridge clinician.



A team of key staff from Mulago Hospital/Makerere University, Professor Byamugisha; Dr Evelyn Nabunya; Dr Annetee Nakimuli (Obstetricians); Dr Andrew Kintu (Anaesthesiologist); and Mr David Nuwamanya (Principal Administrator at Mulago) visited Cambridge in September 2015 to discuss next steps on MNHR collaboration. Mulago Hospital is currently working on policies and guidelines and plans to facilitate input from Cambridge. Results and conclusions will directly feed into establishing clinical checklists, protocols and training of all Mulago clinical staff.

WT-CCGHR projects

Immunogenetics of KIR and HLA-C variants in Ugandan women with disorders of pregnancy

Professor Ashley Moffett and MUII postdoctoral fellow Dr Annetee Nakimuli, are currently investigating the common variants of KIR and HLA genes in case/control studies of pre-eclampsia at Mulago Hospital in Kampala, to determine genetic risks of pre-eclampsia to Ugandan women. There are cogent reasons for studying pre-eclampsia and other disorders associated with poor placentation in an African population not in the least the greater variation of KIR/HLA genes in Africans, which provides an unparalleled opportunity to show how the innate immune system operates to determine successful pregnancy. Excellent progress has been made in collecting a prospective cohort of patients and biological samples for the research. The project is also providing training and capacity building to midwives at Mulago Hospital and has helped to recruit a range of pregnancy pathologies for further research. The study commenced in October 2014 and is funded by the Wellcome Trust Enhancement Fund.

Research on Sepsis at Mulago Hospital

A pilot study on sepsis led by Professor Stephen Bentley from the Sanger Institute and WT-CCGHR was initiated in July 2015 at Mulago Hospital in collaboration with the microbiology team led by Dr Christine Najjuka, Senior Lecturer at the Department of Medical Microbiology, Makerere University. The study is focused on women admitted for elective Caesarean section and aimed to identify the sources of bacterial infections with a particular focus on MRSA (methicillin-resistant *Staphylococcus aureus*). Whilst MRSA has attracted a lot of attention for its impact in Europe and North America, its role in infections in Africa is less well understood. As the numbers of hospital attendances and proportion of hospital births rises in Africa, there is concern that this notorious hospital-adapted pathogen will become a serious problem. In this study, staff at Mulago Hospital collected swab samples from patients, staff and environmental surfaces and screened them for presence of *S. aureus*. Preliminary results indicate that this is indeed a relevant pathogen in this setting and ongoing genomic analyses aim to study sources and routes of transmission.

Cambridge student voluntary placement at Mulago Hospital

Vimal Bedia, a Junior Doctor from Rosie Hospital in Cambridge spent eight weeks at Mulago Hospital (between September and November 2015). Vimal undertook an audit of the pre-eclampsia unit at Mulago Hospital to better understand how patient outcomes could be improved. He was supervised by Dr Annette Nakimuli the obstetrician in charge of the pre-eclampsia unit.

"I cannot emphasise how important working abroad is; I genuinely wish I had done it sooner or for a longer period of time. You truly get to see what your working abilities are but also given the opportunity to build your own confidence and skills by learning from those around you, which making a difference." Vimal Bedia (CUH FY2)

Vimal with his team at Addenbrooke's Hospital are working with Mulago Hospital staff on the possibility of creating protocols for the medical team at the Mulago unit and organising training sessions.

The placement was organised by Addenbrooke's Abroad with support from WT-CCGHR. As part of the Cambridge University Hospital group charity (Addenbrooke's Charitable Trust), Addenbrooke's Abroad provides operational assistance in clinical research, support and training to developing country hospitals.

Africa's Voices Foundation Interactive Radio Project

Professor Ashley Moffett and researchers from Makerere University Professor Grace Kyomuhendo, (Professor of Gender Studies) and Dr Annette Nakimuli (College of Health Sciences) collaborated with the Africa's Voices Foundation in Cambridge to understand attitudes towards complications in pregnancy in Uganda. The study took place from July 2015 to October 2015 in the form of an interactive radio pilot project in the Central Region of Uganda. The aim was to understand beliefs about pre-eclampsia and more generally, the social-cultural drivers that contribute to the grave levels of maternal mortality in sub-Saharan Africa. Preliminary results demonstrate the potential of radio audiences generated data to provide rich insights for effective preventive interventions.

Talks

How collaborating with Africans provides genetic and biological insights in maternal health disparities

Professor Ashley Moffett delivered a seminar on the spectrum of biological, medical, evolutionary and cultural issues that contribute to the tragedy of maternal mortality in Africa. Some of the projects in maternal health underway as part of the Centre were described to illustrate the importance of studying disorders of pregnancy in the population most affected by them. This talk took place on 03 November 2015 at King's College Cambridge.

Complications during pregnancy in Uganda: Researching socio-cultural drivers using innovative methods

Dr Claudia Abreu Lopes (Head of Research and Development, Africa's Voices Foundation) presented findings of a pilot by the University of Cambridge and Makerere University on perceptions towards pregnancy complications. Findings indicate that men focus more on internal causes related to the biology or dispositional traits of women whilst women tend to attribute problems to the low quality of health professionals and lack of support from their husbands. The insights are crucial in shaping context-specific health interventions for improving pregnancy outcomes in Uganda. The research was funded by King's College, Smuts Memorial Fund and a Wellcome Trust (grant held by Professor Moffett

WT-CCGHR builds on existing Cambridge-Africa Fellowships

Two Cambridge-Africa Programme initiatives, THRiVE-2 (Training Health Researchers into Vocational Excellence in East Africa) and MUII-plus (Makerere University-UVRI Infection and Immunology Research Training Programme) strategically partner with WT-CCGHR by generating a critical mass of internationally competitive research capacity in Africa through co-mentorship for PhDs or post-doctoral researchers.

MUII-plus and THRiVE-2 both have specific complementary themes on Maternal, Neonatal and Reproductive health. MUII-plus and THRiVE-2 funded PhDs and Post-doctoral fellowships will be available for Ugandans/East Africans to work in these areas with joint Cambridge mentors.

Other collaborations on MNHR at WT-CCGHR

A joint meeting between WT-CCGHR and the London School of Hygiene and Tropical Medicine/ WT-Bloomsbury London was held in October 2015 to discuss to identify potential research topics and modalities for future collaboration in collaboration with specific partners in sub-Africa. WT-CCGHR closely collaborates with LSHTM on the Wellcome Trust funded THRiVE-2 and MUII-plus in partnerships with Universities and Research Institutes in East Africa.

at the Department of Pathology). This talk took place on 23 February 2015 at King's College Cambridge.

Cambridge-Africa and WT-CCGHR organise regular King's Seminars.

WT-CCGHR and Cambridge-Africa

WT-CCGHR's research themes include Maternal and Neonatal Health, which focuses on preventing the deaths of millions of African mothers and babies. Another major research theme led by Pathology's Dr Peter Bull focuses on Parasitic and Neglected Infectious Tropical Diseases, such as malaria, Ebola, African Sleeping Sickness, Bilharzia, and intestinal parasitic worms. The World Health Organisation classifies many of these terrible infections as Diseases of Poverty and they afflict hundreds of millions of people living the world's poorest and most vulnerable regions.

In these, and other themes on a range of pandemics and non-communicable diseases, WT-CCGHR brings together the diverse skills of researchers from across the whole University, as well as from major research institutes in and around Cambridge, such as the Sanger Genome Institute. These Cambridge researchers are partnering with African colleagues in the Gambia, Sierra Leone, Ghana, Gabon, Tanzania, Uganda, Kenya, and many other parts of sub-Saharan Africa, to carry out world-class research providing solutions for Africa's major health problems.

To ensure this vital research is sustainable in Africa, and continues to be world-class, the Cambridge-Africa Programme creates close supportive and mutually beneficial relationships with partner universities in East (Makerere University, Uganda) and West (University of Ghana, Legon) Africa, to provide research facilities, shared lectures and seminars, and mentorship for the best young African researchers, on whom the future progress of the continent depends.



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