Kirsty Bobrow

A 'StAR' ring role

The CDIA's Dr Kirsty Bobrow is making significant headway in m-Health (Mobile Health) development in Africa, through the SMS-text Adherence Support (*StAR) trial. *StAR is a collaborative project between the Department of Biomedical Engineering and the Primary Care Trials Unit at the University of Oxford, and the CDIA at UCT.

Kirsty is one of several CDIA-affiliated researchers helping to develop mobile-phone based interventions for the screening, diagnosis, and ongoing management of chronic non-communicable diseases in low resource settings.

Kirsty received her Bachelor of Medicine and Bachelor of Surgery at UCT. After being elected as a Rhodes Scholar in 2004, she then went to Oxford and completed a masters in Global Health Science (MPH), and then a DPhil in Epidemiology.

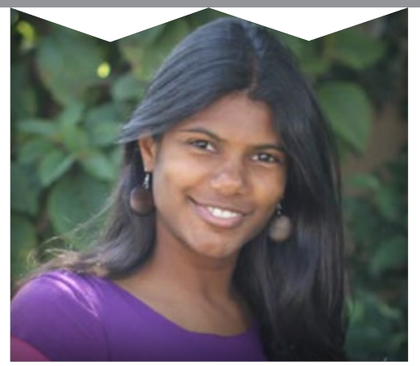
Kirsty is now employed as a postdoctoral research fellow by the Institute of Biomedical Engineering (IMBE), and the Primary Care Trials Unit (PCTU) at the University of Oxford, and is a key member of the CDIA team.

After being paired by professors Lionel Trassenko (Director of IBME) and Andrew Farmer (Director of PCTU), engineers Dr Thomas Brennan and David Springer worked together with Kirsty and senior research staff in Oxford and Cape Town to develop the *StAR trial.

"Partnering with the CDIA was a natural fit for us: Thomas, Dave and I had all spent time during our DPhils working in South Africa, and I had previously worked with Professor Levitt (Director of the CDIA). We were all keen to work within such a collaborative group," says Kirsty.

The *StAR trial is a large randomized trial of the usefulness of an SMS-based adherence support intervention for people being treated for high blood pressure in primary care. Kirsty and her team expect to have data ready for analyses in 2013.

"The field is very exciting and holds lots of potential but it is crucial that research findings are published so we can build an evidence base of what works best", says Kirsty.



Clare Bartels

Making healthy choices

Clare Bartels is helping to bring about a profound change towards healthier lifestyle choices in Africa.

Clare, who is studying her PhD at the University of Cape Town (UCT), UCT/MRC Research Unit for Exercise Science and Sports Medicine (ESSM), recently worked with the CDIA on the iChange4Health project, putting together a tabloid newspaper aimed at informing the public about making healthy lifestyle choices.

The iChange4Health project is a joint initiative of the CDIA and Pharma Dynamics.

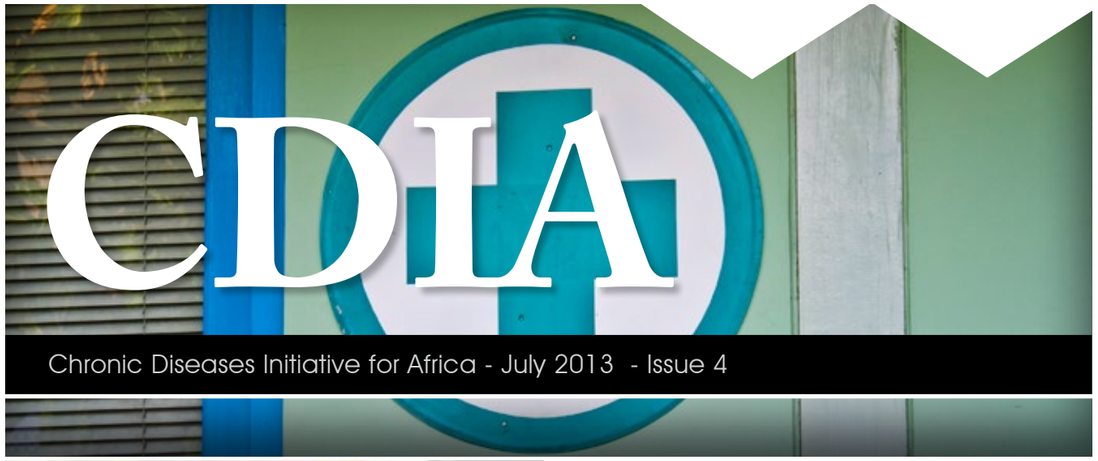
The project has created a series of helpful motivational booklets that provide information and tips regarding lifestyle changes and also showcase people who have broken their unhealthy habits. Its long-term aim is a reduction in the burden of chronic disease in South Africa.

"The whole process was a lot of fun – and so interesting to see the transformation into the finished product, a challenging process but a very rewarding one," she says.

Clare's doctoral research is on active transport in the built environment and how this influences health. "I specifically focus on the MyCITI bus, and measure how active transport could potentially impact health, for example, can one accumulate the daily recommended amount of physical activity of 30 minutes per day by walking to and from the bus stop?"

While studying her Masters qualification in Sports and Exercise Science from the University of the Western Cape (UWC), one of her examiners, Vicki Lambert, spurred Clare on to join the team at UCT to continue her studies at the UCT/MRC ESSM unit. Clare has not looked back.

"I really enjoy what I'm doing – on the African continent there are too few researchers involved in the field of physical activity and the built environment, and its impact on health. I would like to continue research in this area, and become an expert in the field," she says.



Combating Disease

In striving to improve the CDIA's lines of communication with media, funders and other stakeholders, we are proud to bring you our second newsletter of 2013.

Continuing to open new doors for all those involved in the CDIA initiative, in this issue you will find a feature discussing M-Health's role in combating the burden of disease in Africa.

You'll also read about the recent MIT Hackathon, and meet two more important members of the CDIA team.

Please let us have your feedback. You can email us on cdia@rothko.co.za.

CHRONIC DISEASE INITIATIVE FOR AFRICA

Africa **leads cellular health technology** revolution

Necessity is the mother of invention – and in Africa, where high levels of disease threaten to engulf the continent – the medical profession is having to get creative.

According to Dr Sam Surka, researcher from the CDIA, a case in point is the recent advances in cellphone technology and Mobile Health, or M-health, which are showing that an answer to Africa's medical health needs may come from this most unlikely of sources.

Africa has one of the highest HIV/AIDs rate in the world, and an increasing incidence of chronic and non-communicable disease and the associated risk factors. Poor living conditions, over-populated living areas, lack of education and inaccessibility to medical information make this situation incredibly hard to manage. Africa carries more than 24% of the global burden of disease but has an average of only two doctors per 10 000 people.

"Healthcare has always been a huge concern in Africa, especially when doctors and hospitals are far from isolated or remote areas where care is often most needed: M-health is potentially the answer to this," says Surka.

The M-health applications already available offer a wide range of services across the medical spectrum, contributing to a variety of responses to medical needs and conditions, in many cases opening new areas of preventative action impossible before. Surka is currently working on a first-time project for the CDIA to develop a mobile phone application that calculates a total cardiovascular disease risk score and to investigate how this impacts on screening for cardiovascular disease by community health workers.

Mobile penetration in Africa is at 65%, the second biggest mobile market in the world, with half of all internet connections in Africa exclusively on mobile technology.

This accessibility means big things for healthcare – cellphones enable education that is more effective and targeted. "M-health is very much a needs-based innovation. While first world countries are leading in the medical technological sphere, there is certainly a gap between international thinking, and what is actually needed on the receiving end. M-health gives us the ability to ensure we're addressing actual needs," says Surka.

Primarily this is done through the collection of data: the most important feature of mobile phone medical applications is that they are patient-focused; the patient is the one engaging. And through the data that the patient supplies, it is possible to see what areas are most in need of support.

"Importantly, mobile health offers a necessary change to the status quo – for too long the medical sector has been at efforts to switch from doctor centric, to patient-focused care. For the last 50 years this has been happening, and the advent of cellphone technology allows this to an even greater degree," says Surka.

Some good examples of M-Health include: TxtAlert, a mobile tool that sends unique, automated SMS reminders to patients on chronic medication, reminding them to take their medication or perform other necessary tasks. A special tool, called "Please Call Me" allows patients to call their doctors even if they don't have any airtime available by "pinging" their doctor who then calls back.

Young Africa Live is a digital forum where African youths can share stories and get information about HIV and AIDS. It also has helpful numbers and contact details for HIV- and AIDS-related organisations, in an effort to destigmatise the diseases while also providing clear facts and support groups for African youths.

Dr Lindi van Niekerk, researcher at the CDIA and the Bertha Centre for Innovation and Social Entrepreneurship at the UCT Graduate School of Business, says that applications such as these represent the groundbreaking potential of M-health.

"Africa carries more than 24% of the global burden of disease but has an average of only two doctors per 10 000 people."

"Most of these have never been tried before, through any technology – the 'reminder' technology alone could make a significant contribution to combating health issues in Africa. Theoretically, the potential benefit of M-health is enormous," she says.

"In Africa in particular, because of the need; we are actually leading in the development of M-health globally. The South African government especially is encouraging M-health development, and putting its money where its mouth is," says Surka.

"The sky is the limit. We are seeing new technologies available every day, and as more health technicians, service providers, and developers start to roll out M-health initiatives, we will see M-health applications become an integral part of life in Africa, and then we will really start to see a positive change to the health of the continent."

MIT offers **innovative solutions to health challenges**

From the wheel to the pacemaker, innovation has been solving human problems for centuries. Now, the formidable forces of innovation are being turned on healthcare – an industry in crisis the world over – with exciting results.

"Innovation is taking healthcare by storm in the USA, but the same wave has not yet hit our South African shores," says Dr Lindi van Niekerk, fellow of the UCT Graduate School of Business' Bertha Centre for Social Innovation and Entrepreneurship and researcher at the CDIA. "Africa, just like the United States, is facing a myriad of health challenges relating to the colliding of the epidemic of infectious disease, such as HIV, with chronic diseases of lifestyle. These diseases place extreme strain on a system struggling to provide affordable and effective healthcare to an 84% uninsured population."

According to Van Niekerk, now more than ever, South Africa requires innovation from the ground up to transform challenges into new opportunities to deliver improved care to patients and achieve better health outcomes. "But how can we do this?" she asks.

There are no better leaders to learn from than the MIT Media Lab and Health and Wellness Innovation that organise the annual US Hackathon – an event that brings the brightest minds together to actively compel innovation in health.

Van Niekerk was able to attend the hackathon earlier this year thanks to the new collaboration between MIT and the UCT GSB Bertha Centre.

"For two weeks, I was able to surround myself with 80 passionate cross-disciplinary innovators who worked in six project teams to address health challenges like HIV, epilepsy, hypertension, endometriosis, Parkinson's, and cardiac failure. These teams pushed toward new frontiers in patient empowerment. In all health systems, we need to realise that our patients are competent interpreters of their own lives and that our role as innovators is to support them with the best means to do so," says Van Niekerk.

She joined a group of experts developing a mobile application to support HIV patients in managing their disease, a project well suited to a priority need in South Africa. This diverse team of clinicians, software developers, biomedical engineers, health literacy experts, and behaviour-change experts had a range of knowledge and backgrounds that worked to catalyse innovation.

"The first few days allowed for a wonderfully messy and creative process of sharing new and fresh ideas on how patients can be supported with medication adherence.

Lindi van Niekerk (front row, second from the left) at the Hackathon with some of the other innovators.

Hackathon organiser Dr John Moore; Lindi van Niekerk; and entrepreneur in residence at MIT, Julius Akinyemi.

After exploring broadly, we were able to focus on the core components and got started on developing a prototype. From animated videos providing educational insights, to screen designs targeted at both patients and providers, to an incorporated point of care test, the hiVIVA application emerged".

Medication adherence is the number one health management issue for people living with HIV; as such, the hiVIVA application looks to solve this. hiVIVA users have a smartphone application built on the MIT Media Lab's online 'CollaboRythm' platform to help them stay motivated and on top of HIV medication adherence.

Van Niekerk says that while the product outcomes of such an innovation process are, of course, a benefit of attending a two-week event like this – the relationships that result are arguably as great a benefit. "I had the opportunity to form friendships and connections with such special people, including my teammates and members of the extended MIT family," she says.

"I departed MIT more excited than ever and filled with new enthusiasm to take the innovation process back to Cape Town. I look forward to creating a stimulating and enabling environment for our local innovator to uncover novel solutions to improve healthcare for our patients who need it most."