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NEWS RELEASE

UP and Cornell University establish Centre for Transformative Infectious Disease Research on Climate, Health and Equity

Some of the C-CHANGE researchers during a visit to Cornell University: Prof Tivani P. Mashamba-Thompson (UP), Prof Alice N. Pell, Professor Emerita (Cornell), Prof Margaret Chitiga-Mabugu (UP), Dr Heide Hackmann (Stellenbosch), Prof Lindiwe Sibanda (UP), Prof Marinda Oosthuizen (UP), Prof Laura Smith (Cornell) and at the back Prof Barend Erasmus (UP).

Pretoria - The University of Pretoria (UP) and the Department of Public and Ecosystem Health at the Cornell University College of Veterinary Medicine have received a grant from the USA's National Institutes of Health to establish the Center for Transformative Infectious Disease Research on Climate, Health, and Equity in a Changing Environment (C-CHANGE).

Climate change is accelerating the spread of diseases transmitted by mosquitoes and ticks, as well as increasing the risk of zoonotic viruses spilling over from animals to humans. C-CHANGE aims to address these challenges, offering new solutions to the ways climate change is directly impacting global human health. The centre's research will involve collaboration between faculty and students from both UP and Cornell.

"The collaboration between the University of Pretoria and Cornell University marks a significant step forward in addressing the complex intersection of climate change, public health, and infectious diseases," said Professor Sunil Maharaj, Vice-Principal for Research, Innovation and Postgraduate Education at UP. "By uniting experts across disciplines and working alongside vulnerable communities, this research will not only enhance our ability to predict and prevent disease outbreaks, but also foster innovation in sustainable health solutions for both South Africa and the global community."

Dr Alexander Travis, Director of Cornell Public Health, said: "To have the greatest health impacts, we must pivot from reactively responding to outbreaks to proactively understanding the social and environmental conditions that increase risk of outbreaks. If we can understand the conditions that allow diseases to emerge or spread, then we can predict when they will happen and work to prevent them, which is our ultimate goal."

Dr Travis is also the founding chair of the Department of Public and Ecosystem Health, and multi-PI of the centre, along with Dr Marinda Oosthuizen, Professor and Deputy Dean of Research and Postgraduate Studies at UP's Faculty of Veterinary Science.

"Preventing the outbreak of disease before it occurs is the best way to protect the public's health," Dr Travis said. The centre's faculty and trainees will partner with rural communities – primarily in South Africa and New York State – who are most vulnerable to these changes, to collect and integrate diverse data on climate, land use, human and animal health, disease vectors and the pathogens themselves. These teams will create predictive epidemiological models that can both help communities prepare and form the basis of practical, preventative interventions.

This approach solves a long-standing challenge in the field. "Traditionally, academics working in different disciplines, such as the interface of climate change and infectious disease, have had minimal ability to understand or take advantage of each other's approaches and data. And external partners in government and communities typically find these results both inaccessible and unhelpful," Travis said. "C-CHANGE has assembled a truly transdisciplinary team to break down those siloes between disciplines, and between academics and our community partners."

The first major research project will focus on viral pathogen spill over and will be led by UP's Dr Wanda Markotter, Professor and Director of the Centre for Viral Zoonoses in the Faculty of Health Sciences, and Cornell's Dr Raina Plowright, the Rudolf J and Katharine L Steffen Professor of Veterinary Medicine. They will investigate how climate extremes and land use changes result in wildlife stress, increasing both viral shedding and interaction with humans, facilitating viral spill over events.

The second major research project will be led by UP's Dr Oosthuizen; UP's Dr Veronica Ueckermann, Head: Infectious Diseases, Steve Biko Academic Hospital and Associate Professor in the Department of Internal Medicine as well as Dr Megan Riddin, lecturer and researcher at UP's Institute for Sustainable Malaria Control (UP ISMC), and Professor Tiaan de Jager, Dean of UP's Faculty of Health Sciences and Director of the UP ISMC. Dr Laura Goodman, Assistant Professor at Cornell will also be involved with this project.

The researchers will explore animal and human health, ecological and genomic data on tick- and mosquito-borne diseases in the context of climate change. This knowledge will be used to create community-based early warning systems for when to expect increased risk that these vectors will be active and carry and transmit the pathogens. Communities and healthcare systems can then try to prevent and prepare for the diseases they carry.

Two transdisciplinary cores will support these and a series of smaller research projects. The first core, the Living Evidence and Applied Data Modeling Core, led by UP's Dr Vukosi Marivate, Professor and Chair of Data Science and Cornell's Dr Alistair Hayden, Dr Laura Smith, and Dr Ana Bento, will ensure that all data generated is accessible across disciplines to all C-CHANGE researchers and partners. These researchers will also provide training on how to integrate diverse data such as temperature, precipitation, pathogen and vector genomics, human movement, vector life cycles, and human and animal health, in creating holistic models.

The work of the Community Engagement Core is equally critical to the centre's success. Led by UP's Dr Ilana Van Wyk, and Cornell's Dr Gen Meredith, Associate Director of Cornell Public Health and head of its Health Impacts Core, this Core will work in rural communities in South Africa, Zimbabwe and New York State. They will ensure that C-CHANGE's researchers' partner with the most vulnerable communities from the initial stages of research design to the production and communication of results that are useful to those communities.

This focus is essential, Oosthuizen said. "Whether in Africa or North America, rural communities often bear the greatest infectious disease burdens from climate change. The research C-CHANGE performs will help us understand how climate change is increasingly putting people at risk, so we can try to prevent it."

Oosthuizen further notes the unique advantage of C-CHANGE's collaboration: "By combining data and expertise across ecosystems, public health, and social dynamics, we can develop a proactive approach to disease prevention that empowers vulnerable communities. This is not just about managing disease – it's about creating resilience in a changing climate."

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ABOUT THE UNIVERSITY OF PRETORIA

The University of Pretoria (UP) is one of the largest contact and residential universities in South Africa, with its administration offices located on its Hatfield Campus in Pretoria. This 115-year-old institution is also one of the largest producers of research in South Africa.

Spread over seven campuses, it has nine faculties and a business school, the Gordon Institute of Business Science (GIBS). It is the only university in the country with a Faculty of Veterinary Science, which is ranked the best in Africa. UP has 120 academic departments and 92 centres and institutes, accommodating more than 56 000 students and offering about 1 100 study programmes. It has the most academic staff with PhDs (70%), NRF-rated researchers (613).

The 2024 Times Higher Education subject rankings placed UP first in South Africa in the fields of Law, Veterinary Science, Accounting and Finance; Agriculture and Forestry and Electrical and Electronic Engineering. Quacquarelli Symonds (QS) ranked the University among the top five in Africa, as part of their 2024 World University Rankings (WUR). UP was the only South African university featured in the 2023 World University Rankings for Innovation (WURI), falling within in the 101-200 range of innovative universities.

For more information, please go to www.up.ac.za

ABOUT CORNELL UNIVERSITY COLLEGE OF VETERINARY MEDICINE

The Cornell University College of Veterinary Medicine is an international leader in veterinary education, public health, biomedical research and animal medicine. It educates nearly 700 students each year through doctoral programs in veterinary medicine, biomedical and biological sciences, and a master of public health program. Clinicians see approximately 100K patients yearly at its seven hospitals and on farms and field settings, and it has a robust biomedical research program funded by NIH and other federal sources. The college advances environmental and human health, and provides national laboratory diagnostic testing and wildlife surveillance and protection.

For more information, please go to https://www.vet.cornell.edu/