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**7 February 2023**

## **New digital tools to enable UCT scientists prepare for malaria outbreaks in southern Africa**

The Wellcome foundation has provided approximately R487-million to support global research to address urgent health threats brought about by climate change. This funding provides for 24 research teams in 12 countries around the world to develop innovative digital tools to model the relationship between climate change and infectious disease.

One of the 24 global project teams is led by a University of Cape Town's (UCT) science faculty collaboration between the Modelling and Simulation Hub, Africa (MASHA) in the department of Statistical Sciences and the Climate Systems Analysis Group (CSAG) in the Environmental and Geographical Sciences department.

This project brings together disease modelling expertise at MASHA and climate modelling expertise at CSAG to build Health: RADAR - Responsible Access to Data for Analysis and Research. Health RADAR will be an open-source web based platform in which we collate, curate and transform data to catalyse Climate Sensitive Infectious Disease (CSID) modelling. The tool can be used to explore data across a range of diseases in several countries on the continent.

Professor Sheetal Silal, from MASHA and Principal Investigator on Health: RADAR said: "The greatest benefit of the tool is that extensive dissemination and co-creation will enable the tool to be sustained by a growing community of local, African CSID modellers and analysts. While the digital tool will eventually be extended beyond malaria and into other geographic regions on the continent, the primary goal remains the same: to enable the development of CSID models calibrated to operationalisable datasets that are responsibly sourced, where the data characteristics and geographic context are well incorporated."

The Wellcome Trust funded project will allow the development of the foundational tool that will focus on data related to malaria transmission in Botswana, Eswatini, Namibia and South Africa; a region specifically chosen due to the goal and political interest in malaria elimination. Health: RADAR will incorporate health, climate, transmission, entomological, economic and demographic data with emphasis on responsible documentation and data contextualisation with additional support to enable CSID modelling in the region. Local users will be able to both draw from and contribute data to the tool, allowing it to be a living data resource.

Co-investigator, Dr Chris Lennard from CSAG highlighted the importance of incorporating the impact of climate on disease management. He said "It's exciting that MASHA and CSAG can work together to co-produce this platform. Too often our research is siloed and invariably ends up missing important components of each field resulting in the production of deficient knowledge.

In our project we get to understand each other's contexts and co-design and develop a tool whose information is based on (a) the expertise CSAG brings through understanding and tailoring climate data that will contribute to the CSID modelling, as well as understanding regional climate envelopes (of Malaria) and (b) the CSID expertise of MASHA. This allows us to responsibly develop CSID information that is robust, relevant, and actionable by actors serving communities vulnerable to climate-sensitive infectious disease."

A key factor for success in Health: RADAR is the emphasis on local partnership for local relevance. Along with MASHA and CSAG at UCT, project partners include the Malaria Office of the South African Medical Research Council, the South African Development Community (SADC) Elimination 8 Initiative and the Clinton Health Access Initiative South Africa Office.

Like UCT's Health: RADAR, the tools will be developed during the early part of the five-year global projects, with later years being used for implementation and evaluation within communities.

The climate crisis is a health emergency which is threatening the lives and wellbeing of communities around the world in many ways – including the spread of infectious diseases. As global temperatures continue to warm, more places are becoming suitable habitats for disease-carrying mosquitoes. Increases in extreme weather events like storms and floods can also contaminate water supplies and disrupt access to safe sanitation, causing the spread of life-threatening infections.

Felipe Colón, Technology Lead at Wellcome said: "The connection between climate change and the spread of infectious disease is often overlooked, or not made at all. This has resulted in a critical shortage of tools that model the relationship between climate change and disease outbreaks, and those that do exist are often complex and not accessible for local health official and policymakers. Without these, decision-makers are in danger of finding themselves unprepared, leaving communities unprotected in the face of increasing disease outbreaks, risking the lives of millions.

Wellcome is committed to addressing the urgent global health threats of both the climate crisis and of escalating infectious disease. As part of this, we are proud to be supporting 24 global project teams to design and deliver innovative digital tools that can help predict where and when outbreaks might occur and provide early warnings to enable preparations and mitigation measures to be put in place, leading to real-world benefits for the most vulnerable communities."

The software will be open source, allowing researchers and policymakers all around the world to benefit from the tools and support preparations to limit the disastrous impact of climate-related diseases in future.



Professor Sheetal Silal

Photo: Supplied

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***Issued by: UCT Communication and Marketing Department***

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