Uganda: 'Maths Can Help Understand the Spread of Diseases'

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SCIENTISTS want mathematical models to be integrated into research to prevent the spread of diseases, especially in Africa. During a meeting at Grand Imperial Hotel, Kampala recently, a delegation of Canadian mathematicians, African scientists and health officials discussed the spread of pandemics that affect more than one billion people globally.

They discussed issues surrounding the transmission of infectious diseases such as HIV/AIDS and tuberculosis, malaria and river blindness.

The scientists also established teams that will work together to develop solutions based on mathematical models. "This meeting brings together mathematicians and public health researchers to identify key research themes on the diseases that require priority," Joseph Mugisha, a lecturer at the Department of Mathematics, Makerere University, said.

Mugisha said mathematics could show the pattern of a disease, its consequences and the number of people affected.

"We identify the disease, see how it is spread, put it into mathematical equations and study the dynamics. We also study how the disease is transmitted, advise on the control measures and the effects of the drug," Mugisha explained.

He said in developed countries, many mathematicians studied a drug to establish the number of people that can use it.

The maths department at Makerere has started the programme, modelling HIV/AIDS, malaria, sexually transmitted diseases and tuberculosis.

In collaboration with the Mathematics of Information Technology and Computer and Complex Systems (MITACS), a Canadian-based research network, mathematicians from Makerere, public health officials and researchers will use the subject to study the dynamics of spread of disease.

Arvind Gupta, the director of MITACS, said modelling diseases started in China with SARS and influenza. MITACS set up a joint project with Canada and China and identified Africa because the diseases that affect most of her people could be treated.

Gupta said mathematical modelling would be used to simulate the outbreak of a disease in a specific population, enabling scientists to test the effectiveness of various strategies to control its spread.

"Since we cannot allow tuberculosis to spread, in order to see what happens, mathematical modelling is a useful tool because it provides accurate ways to decide who to quarantine and how it can be done effectively," he added.

MITCS is an effective new model for research and development in mathematical sciences - one that addresses research, education and technology transfer.