Bringing Research to LIFE

Poster Competition:
Date Change

Student researchers will get a chance to show off their cutting-edge projects by entering the poster competition now scheduled for Nov. 9 (note change of date). Undergraduate students campus-wide are invited to create posters that depict their research projects. The posters will be on display for the public Nov. 9 from 1 p.m. to 4 p.m. in Room 210-224 of University Centre.

This is the first year the competition is open to students of all disciplines. A panel of judges will decide the top two winners in each of the four categories: applied sciences, natural sciences, health sciences and social sciences/humanities. First-prize winners will take home $500; runner-ups will receive $250.

To enter, contact Shellie Johannesson in the Office of the Vice-President (Research) at 474-7952 or johanne2@cc.umanitoba.ca. The deadline for submissions is Oct. 9.

In Brief

BY KATIE CHALMERS-BROOKS

Every minute, four more young people become infected with HIV. Each day, over 5,000 people die of AIDS. How do you tackle numbers this daunting? With math, according to Abba Gumel.

The professor puts pen to paper to develop and test mathematical models that track the spread of diseases like HIV or H1N1 and determine the most effective plan of attack. He figures out their pattern and tries to predict how many people will get sick, end up in hospital or die. He can also show public health officials how to best control an outbreak by using methods like quarantine, vaccination, and awareness campaigns.

Gumel's world revolves around scores of numbers but he says it's the individuals behind the figures that drive him. He recalls touring a health centre in Botswana and looking into the eyes of a young man in his 20s only minutes away from dying of AIDS. The patient could no longer talk but his eyes spoke volumes.

That was compelling. That was absolutely compelling. I looked at him and he was basically just bones, like nothing. I think by the time we left, he had probably died,” says Gumel. “It’s not just something abstract that mathematical models are doing. It is a well-rounded science that affects the lives of millions of people around the globe.”

His latest project has the potential to make a huge impact. Gumel and his postdoctoral fellow Salisu M. Garba recently constructed a mathematical model (which is a system of equations) that if put into action, they say, would lead to the elimination of HIV in Nigeria in roughly 20 years. About three million people in the West African country (population 150 million) are HIV-positive.

A mathematical model is a representation of reality and, in the context of disease spread, is designed with input from sources like public health officials, clinicians, statisticians and pharmaceutical scientists. Gumel then plugs in different parameters and runs scenarios to determine which control strategy – vaccination, for example – would prevent the greatest number of new infections and deaths.

He says mathematics offers a cost-effective scientific approach for studying disease transmission since it doesn’t require expensive lab equipment and lengthy lab experiments. Mathematical modeling also helps resource-poor nations minimize the burden of diseases while using limited available resources.

Gumel’s recent findings have caught the attention of some Nigeria public health officials who want to know more about his low-cost recipe of counseling, condom distribution and drug intervention. Helping to eliminate HIV in the most populous country in Africa may be a lofty goal, but it’s also a personal mission for the researcher.

He holds Nigeria close to his heart; it’s where he was born and raised, and where he first fell in love with math. At only three-years-old, he would tag along to class atop the shoulders of his uncle, who was a primary school teacher in Kano. One of nine siblings, Gumel recalls hunkering down at the back of the classroom and being enunciated by the sight of numbers his uncle scribbled on the chalkboard for the older school children.

“Mathematics is the science of precision. It is everywhere. It’s the foundation of the natural and engineering sciences,” says Gumel, who is the director of the Institute of Industrial Mathematical Sciences at the University of Manitoba. “Mathematics is about studying the often complex relationships between objects and observing patterns. It’s not just about adding and subtracting numbers.”

Gumel has put his expertise to use to help combat diseases like tuberculosis and West Nile virus. He and his colleagues successfully predicted the 2003 SARS outbreaks in Toronto could effectively be contained using quarantine and isolation.

A few years later, he and his collaborators evaluated Canada’s 2006 preparedness plan for pandemic influenza and discovered it underestimated the projected burden and may have been inadequate to effectively control its spread. His accompanying paper recently received the prestigious Dr. Lindsay E. Nicolle Award from The Canadian Journal of Infectious Diseases and Medical Microbiology.

Now Gumel is part of a team that is working towards achieving the United Nation’s goal of effectively controlling malaria globally by 2015. Every year, malaria kills more than 1 million people.

“Lots of people are dying, especially children. A child dies of malaria every 30 seconds. It’s very deadly. It’s terrible. It’s a big problem,” says Gumel, who believes mathematical modeling can be part of the solution.

To learn more, come to a free public presentation called ‘Using Math for Disease Control’ Oct. 21 at 7 p.m. in the Education Building, Room 290.

Published by the Research Communications and Marketing Unit, Office of the Vice-President (Research)
Comments, submissions and event listings to: lindsay_fagundes@umanitoba.ca
Phone: (204) 474-9020 Fax: (204) 261-0325

umanitoba.ca/research