

Canadian mathematicians, grad students to fight AIDS with numbers

Wednesday, August 13, 2008

WINNIPEG — A team of Canadian graduate students and two leading mathematicians is heading to Africa for a unique fight against AIDS and other infectious diseases.

They will travel to Botswana next week for a workshop that aims to teach students how to control the spread of diseases through math equations and formulas.

"What we're trying to do with our team is develop these mathematical models so that when there's a disease outbreak, health officials have some idea how to answer 'what if' questions," said Arvind Gupta, scientific director of a federally funded math research network called MITACS.

Math models can help health officials map out plans such as where to send supplies and which groups to target with education campaigns.

"It's very important for health officials, because they need to figure out which groups they should target to stop the disease from spreading," Gupta said in a telephone interview from Vancouver. Using models to help understand AIDS, for instance, includes looking at how people interact with others, and which groups are likely to come in contact, he said.

"Once you understand how much interaction there is, you can actually start predicting when you think the disease will get to other groups," said Gupta, whose research group is organizing the trip.

Botswana, located north of South Africa, has one of the world's highest known rates of HIV/AIDS infection. It also has some of Africa's most progressive and comprehensive programs for dealing with the disease.

Though the workshop is happening a world away, projects like this are necessary because of international travel, said Abba Gumel, a mathematician who will help lead the Botswana trip.

"We cannot just say we're sitting here in Canada, we don't care about what's going on elsewhere. Outbreaks in one part of the world, other parts of the world are vulnerable," said Gumel, a professor at the University of Manitoba in Winnipeg.

It's one of the lessons learned in Canada from the SARS crisis more than five years ago.

"It started in China and within a day or two, we had cases in Canada as well," Gumel said.

"If... scientists work with people in China to try and understand what's going on, maybe you could prevent outbreaks in other places, like Canada."

The group of 25 students from Canada and Africa, led by Gumel and Queen's University professor Troy Day, will also learn math tools to help predict outbreaks of diseases such as malaria and tuberculosis.