Pitt receives grant to create virtual models for epidemics

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As the world prepares for a probable resurgence of H1N1 in the coming months, University of Pittsburgh researchers are controlling the spread of infectious diseases virtually with a $13.4 million National Institutes of Health (NIH) grant to establish a Center of Excellence in Modeling of Infectious Diseases. The five-year grant, part of the NIH's Modeling of Infectious Disease Agent Study (MIDAS) program, funds the development and testing of computer simulations that will ultimately enable public health officials and policymakers to evaluate intervention strategies to contain infectious disease outbreaks.

The center, led by Donald S. Burke, M.D., dean of the University of Pittsburgh Graduate School of Public Health, uses census and other data sets to build simulations of individuals as they move about and interact with one another through schools, workplaces, households and communities. By modeling their contacts, the Pitt team is working to determine the likelihood a person will spread the disease to others, and to evaluate which interventions might be the most effective such as school closings, travel restrictions, hand washing, vaccines or a combination of these techniques.

"Stopping the spread of infectious diseases remains one of the most significant public health challenges of our time," Dr. Burke said. "It is difficult to predict how infectious disease control strategies will work because the spread of infection through a population depends on a multitude of factors. But by testing interventions 'in silico' before an epidemic occurs, we can work through which strategies will be the most

likely to succeed in preventing illness and death."

"The MIDAS center at the University of Pittsburgh brings together an exceptionally talented group of investigators," said Irene Eckstrand, Ph.D., who co-directs the MIDAS program at the National Institute of General Medical Sciences, part of the NIH. "Their diverse areas of expertise will be a huge asset in building robust models that provide timely and practical information that public health policymakers need. The center also will serve as a hub for training the next generation of infectious disease modelers."

Projects funded by the grant include: developing statistical tools to define the features of a pathogen and its spread through a population; identifying personal health behaviors and the social factors that influence decision-making related to prevention; tracking the evolution of infectious diseases over time; studying the impact of the seasons and variations in climate on infectious disease trajectories; putting a system in place to effectively implement an intervention; and providing new computational tools to local health officials.

These projects build on large-scale simulations previously developed by Dr. Burke and his colleagues to control a threatening avian influenza pandemic. These models were influential in forming the World Health Organization's decision about the size of antiviral medicine stockpiles needed to quash a possible avian flu outbreak, and in shaping U.S. Department of Health and Human Services' policies about the impact of "social distancing" during an influenza epidemic.

Source: University of Pittsburgh Schools of the Health Sciences (news : web)