NEWS RELEASE

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NTU develops novel strategy to improve the containment of infectious diseases outbreak – interest from World Health Organisation representatives at Hong Kong eHealth Forum

Crises such as SARS and avian flu in recent years have highlighted the urgent need for continued research to address disease prevention, identify outbreaks and monitor and evaluate control strategies. With this in mind, Nanyang Technological University (NTU) researchers have developed a novel strategy to improve the containment of infectious diseases outbreak.

The NTU research, a novel Digital Ring Fence (DRiF) strategy, was presented and well received in Hong Kong’s inaugural eHealth Forum held in September 2006. The presentation also attracted keen interest from representatives of the World Health Organization's Lyon Office for National Epidemic Preparedness and Response, who were at the forum.

In disease epidemiology, the term “ring fence” denotes an activity to corral the spread of infection by isolating and monitoring individuals that have come into contact with infected individuals.

The NTU team uses a novel mathematical approach to investigate the spread and control of infectious diseases in closed communities. Their research focuses on rapid containment of acute disease outbreaks, using DRiF strategy that leverages on a Geographical Information System (GIS) platform to map the extent and spread of the outbreak.

Data from probable cases are captured in a secure database. Postal codes of addresses facilitate precise mapping of the location of each probable case on a multi-layered GIS system. A DRiF is constructed around each location based on data of individuals coming into contact with each probable case. The radius of
the DRiF gives the overall risk of infection from its epicentre, the probable case. By applying the DRiF strategy to a GIS, areas of population concentrations can be readily identified to direct outbreak containment efforts.

SARS has provided convincing evidence that the key to tackling acute infectious disease outbreaks lies in containment and making disease containment one step ahead of its spread. The DRiF strategy adds value to conventional GIS techniques in disease epidemiology by defining disease risk zones to corral the spread of infection. In relation to the current avian flu threat, the DRiF strategy can potentially find useful application in demarcating culling zones for the containment of bird flu infection in relation to risk of spread of the infection as well as containment of person-to-person transmission should it occur.

This project is led by Professor K C Lun of NTU’s School of Biological Sciences. The research team, consisting of Prof Lun and two research associates, took about one and a half years to develop the strategy.

Says Prof Lun: “We have chosen to work on this strategic project because of the increasing global threat from the spectre of bioterrorism and Emerging Infectious Diseases (EIDs) such as SARS. We are pleased that we have succeeded in developing this novel digital ring fence strategy because not all countries can successfully enforce the physical ring fence strategy that Singapore implemented during the SARS epidemic. Our DRiF strategy could potentially have many useful applications in the field of epidemiologic surveillance and containment of infectious diseases. Our team is excited to have come up with this strategy and hope it will contribute to public health benefits to Singapore and to the world. This would be yet another example of how research at NTU meets real world needs.”

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About Nanyang Technological University

Nanyang Technological University (NTU) is a research-intensive university with globally acknowledged strengths in science and engineering. The university has a beautiful garden campus and a distinguished lineage with roots that go back to 1955.

NTU has 4 colleges, comprising 12 schools. The College of Engineering, with six schools focused on technology innovation, enjoys wide renown and currently ranks fourth in the world in engineering publications. The College of Science is at the forefront of Singapore’s life sciences and science initiatives, while the Nanyang Business School (which is the College of Business) offers one of the world's top 100 MBA programmes. The College of Humanities and Arts boasts Singapore's first professional art school offering degree courses in art, design and interactive digital media, the Humanities and Social Science School, and the Wee Kim Wee School of Communication and Information, one of the best communication and information schools in Asia.
The 13th school, S Rajaratnam School of International Studies, will be inaugurated in 2007. An important component of this autonomous school is the Institute of Defence and Strategic Studies, long recognised as a world authority on terrorism.

NTU is also home to the internationally-acclaimed National Institute of Education, Singapore’s only teacher-training institute.

Ranked among the top 50 universities in the world, NTU has in place multi-country programmes and initiatives with established institutions worldwide. Some examples of key partners include MIT, Stanford University, Cornell University, Caltech, University of Washington, Carnegie Mellon University; world-class universities in Asia such as Beijing University, Shanghai Jiaotong University, Waseda, IIT of India; and top European universities like Cambridge University, Imperial College, Ecole Polytechnique Fédérale de Lausanne, University of St Gallen, University of Technology of Compiègne and University of Technology of Troyes.

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