Research develops new model to anticipate disease outbreaks at 2012 Olympics

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A research team led by St. Michael's Hospital's Dr. Kamran Khan is teaming up with British authorities to anticipate and track the risk for an infectious disease outbreak at the London Olympics this summer.

For the first time, experts from around the world are working together to integrate technologies and disease surveillance at both local and global levels.

"Systems that track infectious diseases at the global level are poorly connected to those at the local level," said Dr. Khan, lead author of a paper published Monday in the Lancet Infectious Diseases. "But by integrating them, we can create a novel and more effective approach to preventing infectious disease risks at mass gatherings, such as the Olympics."

Traditional surveillance efforts have mostly focused on the host city and country of a mass gathering to detect and quickly arrange for medical and public health responses. However, new technologies that look at how people move within a mass gathering offer insights into how the spread of disease can be affected by crowd behaviour.

For this piece, the authors have drawn on expertise from colleagues in Britain and Saudi Arabia, which hosts the Hajj pilgrimage, the world's largest annual mass gathering of approximately three million pilgrims.

This technology is combined with Dr. Khan's Bio.Diaspora – a system

that uses air traffic patterns to predict the spread of infectious disease – and new internet-based tools that can detect disease outbreaks in real-time. Together, this knowledge can help direct surveillance efforts globally to specific cities and outbreaks that pose the greatest risk to a mass gathering, even before the event starts.

"Connecting all the pieces offers us early detection of global outbreak events, an assessment of how likely these events are to enter the mass gathering venue, and an understanding of the local implications of what imported disease might do and how best to mitigate those risks," Khan said.

Bringing together the different models has involved assembling a worldwide group of specialists, including experts from WHO, Britain, Saudi Arabia, the U.S. and Canada.

This new approach "could produce the first real-time risk monitoring and assessment platform to strengthen awareness of global infectious disease threats before, during and immediately after mass gatherings," the authors said.

Provided by St. Michael's Hospital