1080-92-357 **Jing Li***, Department of Mathematics, Pennsylvania State University, University Park, PA 16802, and **Timothy C Reluga**, Department of Mathematics, Pennsylvania State University, University Park, PA 16802. *A mixed-strategy game theoretical approach for infectious disease prevention by social distancing.* Preliminary report.

In this talk, we describe a population game in which individuals are allowed to decide between adopting different social distancing strategies with the goal of lowering the infection risk and maximizing payoffs. When the reduction in infection risk is a convex function of the cost of social-distancing investment, there is a unique pure-strategy game equilibrium. When the reduction in infection risk is not convex —e.g., when the infection risk reduction function is a decreasing function of social-distancing with the property that the concavity changes once— a trivial social-distancing strategy is a global Nash equilibrium for lower cost of infection and a positive social-distancing strategy is a global Nash equilibrium for higher cost of infection. The case for intermediate level cost of infection is more complicated since there are two local Nash equilibria which allows an individual to make a choice between these two Nash equilibria. Therefore, a mixed strategy is one of the possible solutions as a global Nash equilibrium. (Received January 31, 2012)