

**Program in Industrial & Systems Engineering
IE 8773-8774**

Title: Two Applications of OR/MS in Health Care

by

**Dr. Pinar Keskinocak
Co-director, Center for Humanitarian Logistics
Georgia Institute of Technology**

**Wednesday, November 18, 2009
3:15 PM – Refreshments before the seminar
3:30 PM – Graduate Seminar**

Room 4125 A & B Mechanical Engineering

Abstract: The seminar will focus primarily on the first topic, and I will provide a brief overview of the second topic.

Catch-up Scheduling for Childhood Vaccination: The Centers for Disease Control and Prevention (CDC) recommends a vaccination schedule for every child between ages 0 and 6. While parents and health care providers try to follow this schedule to the extent possible, it is estimated that as high as 50% of the children miss the recommended schedule some time during their first six years. We developed a tool that generates a personalized vaccination schedule for a child, given his birth date and the times and doses of the vaccines administered so far. The schedule ensures that all remaining doses are administered, the spacing between doses of the same vaccine adheres to the minimum gaps, and the timing of the doses does not violate the minimum age limit. We define an external wrapper that allows the user to easily make changes to the existing rules and adding new vaccines to the schedule lineup. The tool has been made available for free download from the CDC website (<http://www.cdc.gov/vaccines/scheduler/catchup.htm>) and has been downloaded 25,000+ times since May 2009. This is joint work with Dr. Larry Pickering from CDC and Emory University, Ph.D. students Hannah Smalley and Tuba Yilmaz, and former Ph.D. student Faramroze Engineer.

Modeling Pandemic Influenza and Strategies for Food Distribution: During a flu pandemic, it is estimated that a considerable percentage of working adults may become ill and a significant workforce loss may occur during peak because of illness, fear of infection, and the need to care infected family members or school-aged children. Food and water supplies and transportation services may be interrupted. To aid with planning, we model the spread of pandemic influenza, both geographically and over time, using an agent-based simulation approach. We test the impact of different intervention strategies, seasonality, and virus mutation on the spread of the disease. We then combine this with an optimization model to identify and dynamically update the appropriate locations for food distribution facilities, and test our models using data from Georgia. This is joint work with Professor Julie Swann and Ph.D. students Ali Ekici and Pengyi Shi.

Dr. Pinar Keskinocak

Bio: Pinar Keskinocak is an Associate Professor and the co-founder and co-director of the Center for Humanitarian Logistics in the School of Industrial Engineering at Georgia Tech. She received her Ph.D. in Operations Research from Carnegie Mellon University, and her M.S. and B.S. in Industrial Engineering from Bilkent University. Before joining Georgia Tech, she worked at IBM T.J. Watson Research Center in Yorktown Heights, NY. Dr. Keskinocak's research focuses on supply chain management, applications of operations research and management science with societal impact (particularly health and humanitarian applications), pricing and revenue management, and logistics/transportation. She has worked on projects with several companies, governmental and non-governmental organizations, and healthcare providers, including Intel, Alpa, American Red Cross, CARE, Centers for Disease Control and Prevention, Pan American Health Organization, and Children's Healthcare of Atlanta.

She has served as an associate editor of IIE Transactions, Production and Operations Management, Manufacturing & Service Operations Management, and Management Science. She currently serves as INFORMS (The Institute for Operations Research and Management Science) Vice President of Membership and Professional Recognition. She is the co-founder and president-elect of INFORMS Section on Public Programs, Service, and Needs. topic was optimal allocation of budget for HIV prevention in injection drug users