



Estimating the Long Term Benefits and Harms of CT Screening for Lung Cancer

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Lung cancer is the leading cause of cancer related deaths in US. According to the American Cancer Society, the 5-year survival rate for the early stage lung cancers is around 52% as opposed to 16% for all stages combined, however, only 15% of lung cancers are diagnosed in this stage. In this talk, I will present our ongoing research on modeling the natural history of lung cancer and screening with computerized tomography (CT) for lung cancer early detection. I will present a microsimulation model designed to simulate the single-arm Mayo CT Screening Study and a hypothetical no-screening arm to estimate the impact of CT screening on lung cancer specific mortality. Embedded in the screening simulator is a sub-model of natural history of lung cancer with parameters estimated using data on lung cancer specific survival by stage, tumor size, gender and subtype from SEER database in the absence of screening. The model is used to predict the observed results of the clinical study and estimate long term effects of screening both in terms of mortality reduction and overdiagnosis which were not possible to estimate reliably from previous screening trials due to limited period of follow-up.

Ayca Erdogan is a postdoctoral research fellow at Stanford University School of Medicine. She received her PhD in Operations Research from North Carolina State University, and B.S. in Industrial Engineering from Istanbul Technical University, Turkey. Her research interests are in decision making under uncertainty with an emphasis on problems related to health care, including delivery operations and medical decision making in the individual and population level.

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