Reducing Delays for Medical Appointments: How Physicians Can Make More Money with Fewer Patients

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Timely access to care is a key component of high quality healthcare. Yet, the average wait for a primary care appointment in the U.S. is over three weeks and about a third of all patients identify difficulty in getting an appointment as a significant obstacle to good health care. These delays not only lead to patient dissatisfaction, but can also result in adverse clinical consequences as well as increased use and overcrowding of emergency rooms. Growing appointment backlogs are largely due to increased financial pressure on physicians which leads them to try to deal with more patients. However, longer backlogs are associated with higher levels of last-minute cancellations and “no-shows” which result in wasted time and lost revenue for physicians. Though many medical practices are trying to reduce backlogs, there is currently no tool to help them determine how large a patient population “panel” can be reasonably handled with a given supply of physician appointment time.

In this paper, we develop a queueing model that allows healthcare managers to identify patient panel sizes that are consistent with delivering timely care, given the impact of cancellations. In particular, we conceptualize a medical appointment dynamics as that of a single-server queueing system in which customers who are about to enter service have a state-dependent probability of not being served and may rejoin the queue. We derive stationary distributions of the queue size assuming both deterministic as well as exponential service times and compare the performance metrics to the results of a simulation of the appointment system.

(joint work with Linda Green)