A game theoretic model of the behavioural gaming that takes place at the EMS - ED interface

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Abstract

Operational Research (OR) techniques provide a toolkit of mathematical modelling approaches that are routinely used for problem solving in many sectors. Recent research shows that behavioural studies may accompany such techniques and offer some additional insight to the problem studied and thus enrich some of the already existing traditional methods. Ethnography is considered to be one of the main such approaches.

Ethnographic studies have been around since the 19^{th} century and their main guiding methodology is that a researcher that aims to study a specific social setting should acquire a deeper understanding of the cultural norms and values. The main technique that accompanies ethnography is participant observation, where the researcher participates in the social setting they wish to study recording their observations.

The application of these ideas and principles considered here is the emergent behaviour that takes place at the interface between Emergency Medical Services (EMS) and the Emergency Department (ED). Numerous decisions are taken by both patients and staff alike that determine the level of workflow and the patient pathway. There is empirical evidence to suggest that imposing targets in the ED results in gaming at the interface of care between the EMS and ED. In this work, multiple scenarios are examined where an ambulance service needs to distribute patients between neighbouring hospitals. The interaction between the hospitals and the ambulance service is modelled in a game theoretic framework, supported by a novel Markov model, where the ambulance service has to decide how many patients to distribute to each hospital.

This work brings together ethnography and game theory to understand the emergent behaviour in healthcare settings. The talk will present the problem being tackled at the interface of the EMS and the ED that is to be further informed by ethnographic methods.