R068: Using data science and systems engineering to plan patient-centred outpatient healthcare services – QUB

Patients who use outpatients services in Northern Ireland may have to wait a long time to receive care. For some specialities, waiting times of several years are now common. Healthcare is a complex adaptive system. Systems engineering approaches play an important role in solving complex health care problems. Understanding the healthcare demand of, and supply to, a population is important for planning future healthcare capacity and resilience, and for assessing the impact of services. This study aims to understand the safety, flow, quality and productivity of outpatient services. Possible patient pathways will be identified using routine health service data using a process mapping technique. The study will evaluate trends over time in individual Northern Ireland outpatient services through analyses of demand, capacity, and load. Statistical methods will be used to explore the epidemiological characteristics of the population that uses the services and to identify patterns of co-morbidity among patients who attend outpatient services. System engineering approaches such as causal loop diagrams, and system dynamics will be used to simulate the existing system and search for alternative forms. System performance indicators such as waiting time, cost of service and patient, travel time will be modelled. We will work closely with patient, public, HSC and Department of Health stakeholders to shape this work and disseminate the findings. The work was prompted by the Western Health and Social Care Trust 'Pathfinder' project in Fermanagh and West Tyrone, where access to services and travel times were identified as important issues. The project will take a whole population view, including data from all of Northern Ireland.

Aim: To provide evidence that informs the design of outpatients services towards improving safety, flow, quality and productivity.

Objectives:

1. To describe the epidemiology of outpatient healthcare use in time, place and person, including the patterns of attendance at multiple specialties.

2. To describe the demand, activity, lead times and work in progress for outpatients services

3. To describe the travel time and travel distance for the current service configuration, and how this is distributed within societal groups (e.g. by age, deprivation)

4. To test, through modelling, the effects of alternative service designs on travel times and distances, and waiting times.