

Saker Solutions

Part of the ITI Group

Simulation in the Health Service

Introduction & Background

Healthcare provides some of the most challenging issues facing us all today. Pressures from an ageing population, improvements in technology and treatments and external targets and pressure on budgets make it more and more important that Healthcare is delivered as efficiently as possible. Simulation provides a method of analysing performance of an existing or planned system to improve performance by helping to identify areas where improvements can be made and providing an objective quantification of the effects of change.

The potential scope for Simulation within interconnected Healthcare systems runs from the strategic level encompassing national issues through to the tactical or operational levels for an individual ward or clinic. A 3D interface helps to visualise the system as it evolves over time and is a powerful and persuasive tool.

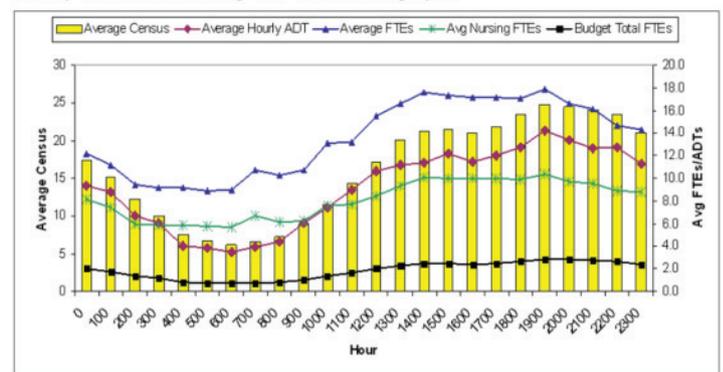
Applications for simulation in healthcare are numerous. A subset of these are:

Allocation of resources - where should money be spent?

The national budget for healthcare is limited and simulation tools can provide a view of the long term benefits of capital expenditure. For example if a new Renal care unit is to be constructed what capacity is required, given changing patient demographics and a projected facility life of 25 years? A Simulation will allow decision makers to understand the effects of changing patient numbers and to commission a 'future proof' facility.

Waiting list modelling - simulation offers a proven method of modelling waiting lists. A simulation model can graphically illustrate the value of capacity or schedule changes in shared resources, such as operating theatres, imaging and other diagnostic and treatment facilities, in reducing waiting times.

Hourly Census vs. Staffing - All Worked Employees



Special points of interest:

- Healthcare is a demanding business with often complex decision rules and multiple constraints.
- Simulation is capable of modelling complex processes allowing users to evaluate the relative benefits of different operating strategies.
- Saker Solutions are ideally positioned to help organisations to assess the benefits of simulation

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Operating Theatre Modelling - operating theatres have a complex relationship between patient lists and the staff and other resources required in their care. These can be explored in a simulation so that issues such as recovery bed usage and blocking, shared anaesthetic rooms and patient mix can be investigated.

ED modelling - Emergency Departments are subject to large variations in both daily workload, and seasonal demand. Simulation modelling can demonstrate how the ED resources can best be used to meet demand while taking into account the interconnected nature of an ED and various admitting departments

Assessment Units (AMUs) - Modelling the impact of an AMU on ED performance can help justify capital expenditure, and will help to ensure that staff numbers and skills are correctly specified from the outset.

Outpatient Clinic Modelling - The move to "one-stop" facilities that provide specialist consultation and diagnostic procedures within the same visit pose problems in scheduling especially when diagnostic facilities are shared. Simulation can be used to assess how patients can be more effectively scheduled, based upon the case mix.

Facility Design - operating theatres, ED and Clinic modelling all fall into the category of facility design and operational improvement where specific tools such as Flexsim provide targeted functionality. Simulation will help to answer questions such as: how many rooms; how many staff; how busy will it be; what are the waiting times?

Pathology - as a vital resource, pathology must have the capacity to accommodate the demands made upon it. Simulation of pathology processes will allow changes to be made in the wider hospital system with confidence that results will be returned to agreed time standards

Bed Planning - in designing new hospitals and in running an existing hospital, planning bed availability is a key issue. Simulation modelling allows prediction of bed occupancy based upon planned admissions and historical emergency admissions. Unpredictable events, such as the effect of Flu, can be simulated to test readiness strategies

Ambulance response modelling - Simulation modelling can be used to predict response times based upon location and number of crews, and when combined with ED modelling how long will waiting times on arrival be?

People/Equipment & supplies movement - The design of a new hospital and the operation of an existing one can be compromised by the problems of moving patients, staff, visitors and supplies around it. Simulation can help identify potential and actual bottlenecks and inform actions to overcome these problems such as using dedicated lifts for patients or AGV systems for the movement of food, linen and samples.

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