

Project title: Optimising the Organ Supply Chain – A Process Modelling Approach

Studentship Code: ECS4

Background to research and synopsis

Despite the progress made in terms of organ donation and transplantation, the UK still faces a shortage of donated organs with over 7000 persons on the UK National Transplant waiting list, and people dying while waiting for a transplant (NHSBT, 2014). It is clear that there is still a need for improvement of the transplant pathway, and that this could be achieved through the optimisation of processes and resources at every stage of the pathway.

However, the organ donation and transplantation system is quite complex, e.g. geographically spread transplant centres, retrieval teams' priority order, variation in organ shelf lives, difference of in transplant centres' policies and surgeons' opinions, variation in organ allocation schemes...

The main aim of this project is to model the organ supply chain taking into account the importance of coordination between the stakeholders within a limited timescale and under contained budget. The first part of this project is to adapt process modelling approaches to formalise the transplant process at individual and aggregate levels. The second part consists in developing optimisation algorithms in order to model the organ supply chain subject to synchronisation and geographical constraints. For validation purpose, a simulation model is to be developed.

The UK Transplant Registry data contains demographic and socioeconomic profiles, type of treatment received, and clinical and administrative information related to transplants for all transplant candidates and recipients in the UK. The data is accessible to the public for research purposes only.

This project will enable the student to develop further skills in operations research, process modelling and statistics. The student will be encouraged to attend relevant conferences, participate in the University of Westminster Graduate School training programme and have the opportunity to obtain a Postgraduate Certificate in teaching and learning.

NHSBT (2014). *Taking organ transplantation to 2020: a detailed strategy*.

http://www.nhsbt.nhs.uk/to2020/resources/nhsbt_organ_donor_strategy_long.pdf

Recent publications relevant to the project

Chahed, S., Feillet, D., Sahin, E. and Dallery, Y. (2011). The anti-cancer drug supply chain: a coupled production-distribution problem. *Supply Chain Forum: an International Journal*, 12(1), 22-30.

Tadger, M., Chausalet, T.J., Fouladinejad, F. and Chahed, S. Using data mining and Simulation for health system understanding: an application to urgent care. Submitted to *BMC Public Health*.

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For details of how to apply:

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