

OR, Academics and the Health Service

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MASHnet launch 2005

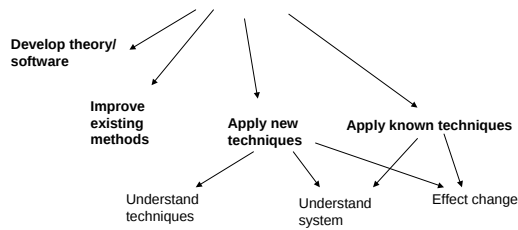
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What is OR?

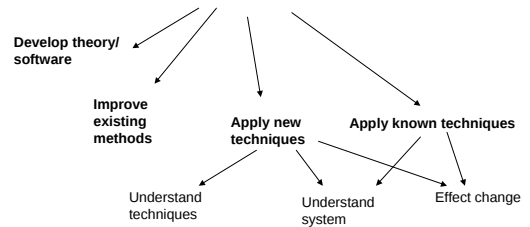
Operational Research ("OR"), also known as Operations Research or Management Science ("OR/MS") looks at an organisation's operations and uses mathematical or computer models, or other analytical approaches, to find better ways of doing them.

OR Society Website www.theorsociety.com

Academic OR

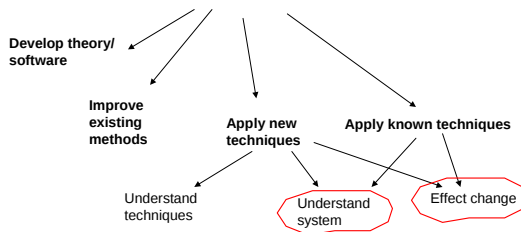


Academic OR



Publish

Academic OR



Publish

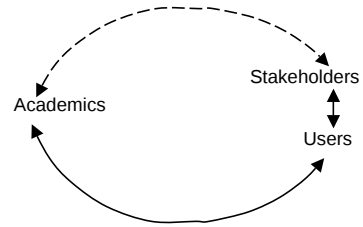
What are the characteristics of academic research in the health context?

POSITIVE

- ⌘ New techniques
- ⌘ More detailed models
- ⌘ Insight into health system
- ⌘ More general applicability of ideas
- ⌘ In public domain

NEGATIVE

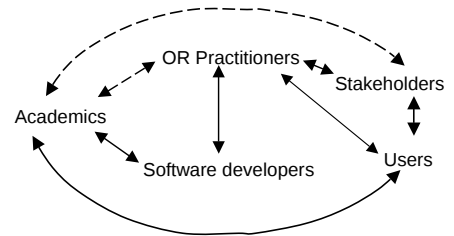
- ⌘ May be little emphasis on effecting change
- ⌘ Software may not be "user friendly" or generic
- ⌘ Slow response to question



Who are the stakeholders in the health service?

- Public
- Patients with need for treatment
- Patients with need for care
- Staff
- Politicians

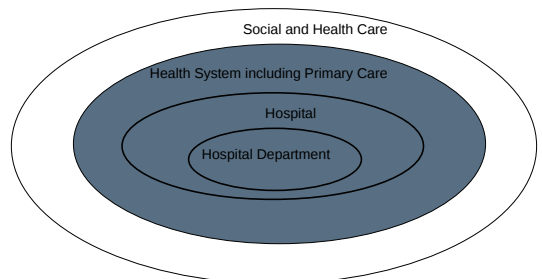
How do we link up with others?



What objectives do we want for a health service to take account of stakeholders?

- Use resources efficiently - **managers**
- Improve disease identification and treatment - **patients**
- Improve quality of care, quality of life - **public**
- Increase public faith in service - **politics**
- Increase staff satisfaction with service - **staff**

System Boundaries

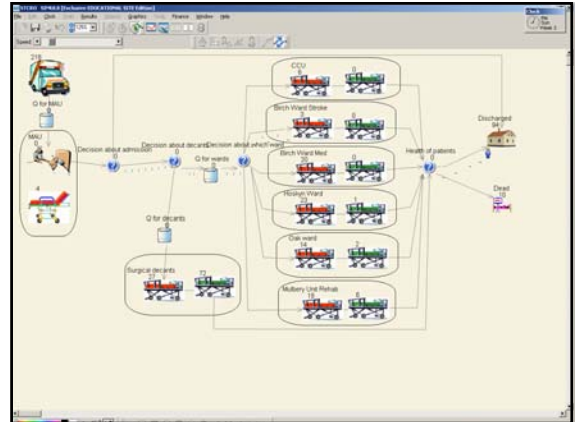


Example: Small Satellite Hospital

The key project deliverables are to:

Develop a simulation model to:

- show how beds could be used more efficiently;
- show effect of reducing length of stay for particular conditions;
- show the effect of treating particular patients in the community.



Activities

- Find data
- Classify patient data – flow through system, length of stay
- Analyse patient data
- Check results against known statistics
- Fit distributions, develop model, validate
- Run scenarios
- Discuss model with hospital staff



Output

- Vary number of admissions and length of stay of admissions
- Look at reductions in number of beds
- Find number of outliers
- Overall ward occupancy



A simple model but..

- Data is already getting out of date
- What is happening outside is influencing what is happening inside and vice versa
- Is the whole system cheaper?
- Are the patients better off?
- What about the politics?

Consider objectives

- Use resources efficiently
- Improve disease identification and treatment
- Improve quality of care, quality of life
- Increase public faith in service
- Increase staff satisfaction with service

*Only looking at hospital resources and not other resources
Efficiency may have behavioural consequences
May have a negative effect on other objectives*

Challenges for academics

- ⌘ Useful type of model that could be replicated
- ⌘ Where to draw the system boundaries?
- ⌘ What objectives and output measures do we need?
- ⌘ How do these effect the stakeholders?

Example 2: How many kidney machines do we need, now, and in the future?

Costs

From 1996 Department of Health Renal Purchasing Guidelines updated to 2000

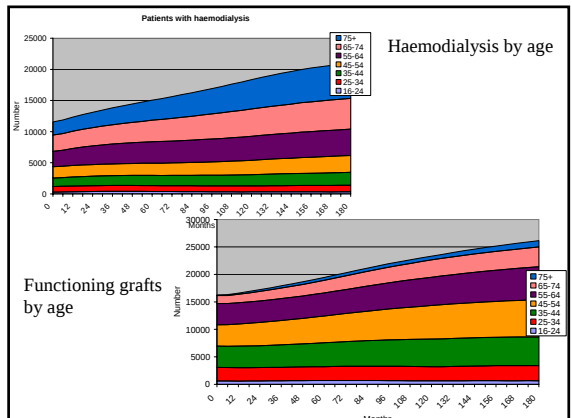
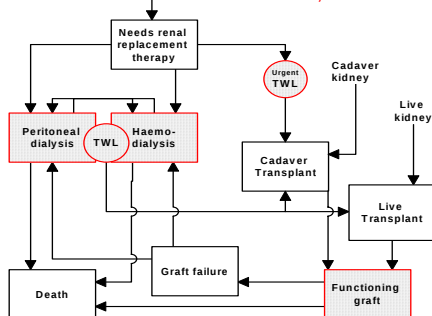
	£
Haemodialysis p.a.	34,500
Peritoneal p.a.	20,000
Functioning transplant p.a.	6,500
Live transplant	35,000
Cadaver transplant	20,000

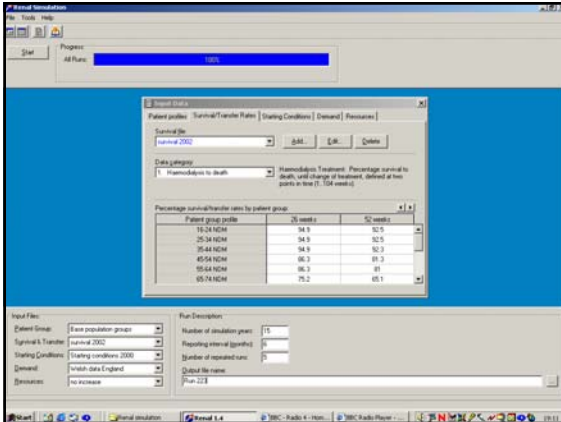
Academic contribution

- ⌘ Development of simulation software POST – can model patients in more than one queue and more than one activity
- ⌘ Multidisciplinary analysis of disease trends by age and disease type
- ⌘ Provision of software that can be easily used and updated

Patient Flow in DES Model

DES model 2002/3
Roderick, Davies et al.





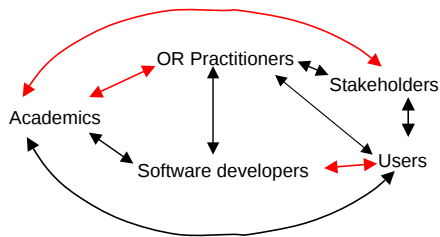
This is model has potentially high demand

What is wanted?

- Model to be cheap or free
- Very little data analysis
- User friendly - able to be used by non-OR people
- A credible answer!

Who should do this – academics, software developers, practitioners?

Contribution of MASHnet



OR can provide better understanding of systems and facilitate constructive change.

