Waiting lists, performance targets, and simulation for alternatives in reducing patient backlog

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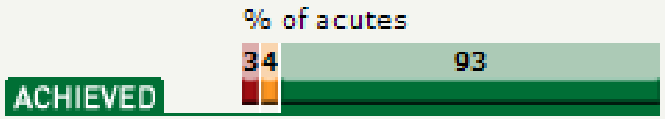
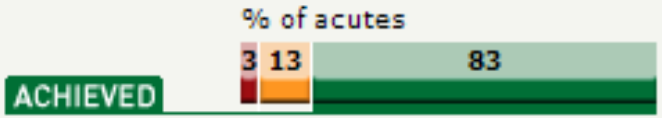
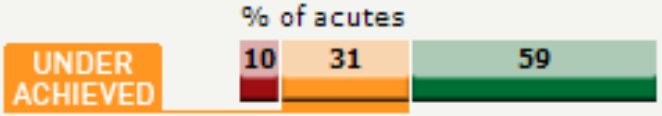
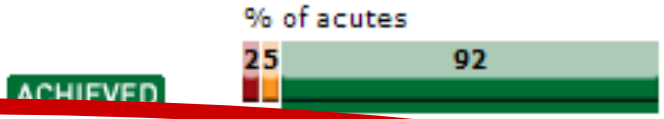
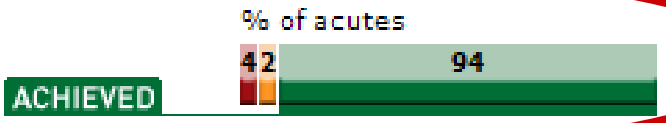
UK National Health Service (NHS) performance assessment framework

- Worldwide problems in healthcare provision
  - Escalating costs
  - Increasing demand & expectations
- NHS: healthcare free at the point of need
  - Current cost approx £90B pa
  - Historic poor performance (long waits)
  - Series of quasi-market reforms
- NHS performance assessment framework
  - Original: star ratings for NHS Trusts
  - Now: annual health check for NHS Trusts
  - Targets: stress waiting time reduction

"Acute Trusts" Performance Targets

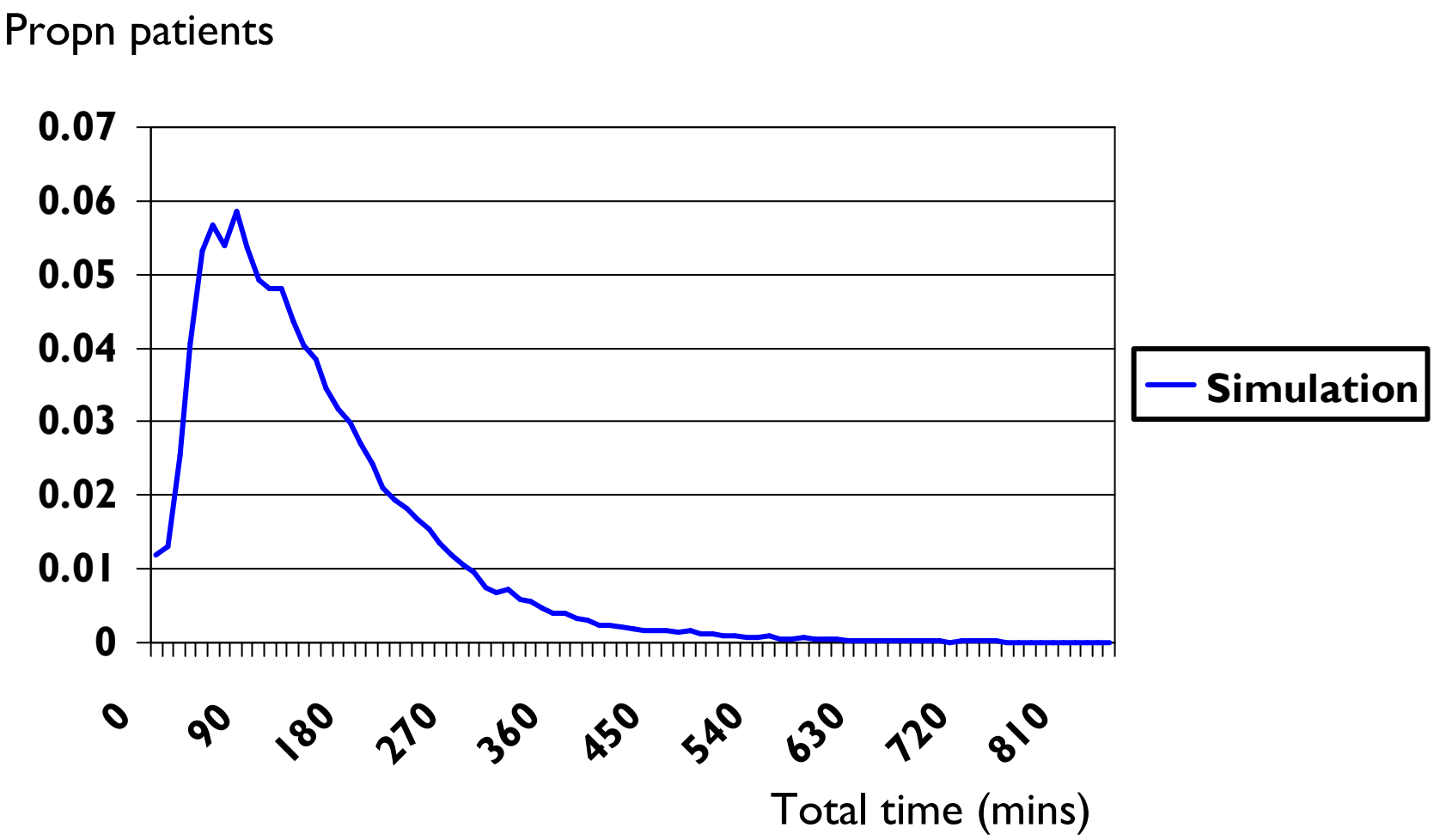
Maintain the four hour maximum wait in A&E from arrival to admission, transfer or discharge.	
Achieve a maximum wait of six months for inpatients by December 2005.	
Achieve a maximum waiting time of two months from urgent referral to treatment for all cancers by December 2005.	
Achieve a maximum wait of three months for an outpatient appointment by December 2005.	
To ensure that by 2008 nobody waits more than 18 weeks from GP referral to hospital treatment.	

*** All figures from** http://annualhealthcheckratings.healthcarecommission.org.uk

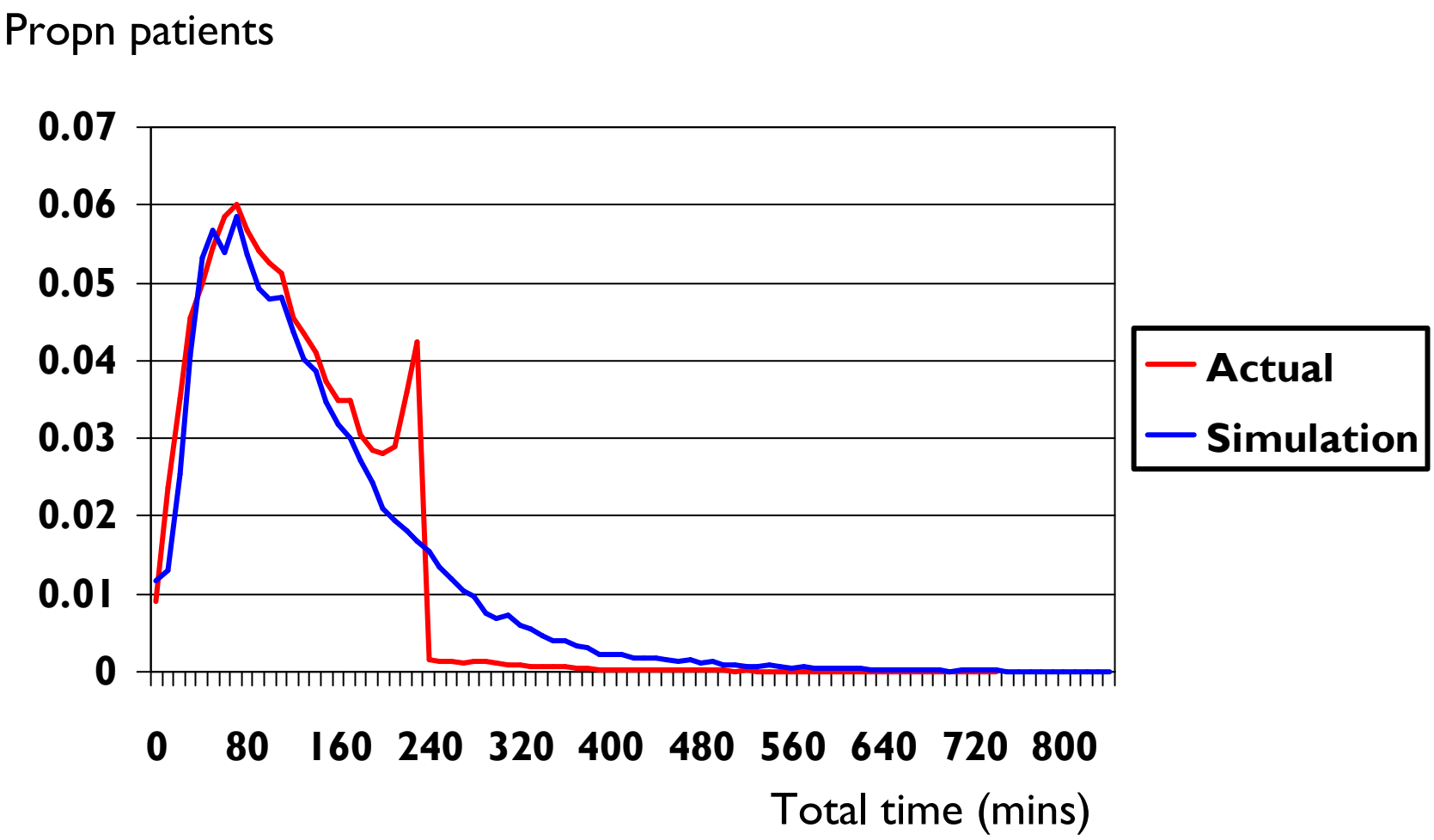
Objectives

- To evaluate feasibility of NHS performance targets and their interactions
- To build a whole hospital simulation model with
  - generic features [to be used by different hospitals]
  - "plausible" level of detail [to gain users' confidence]

4 Hr. A&E Target: An A&E in England

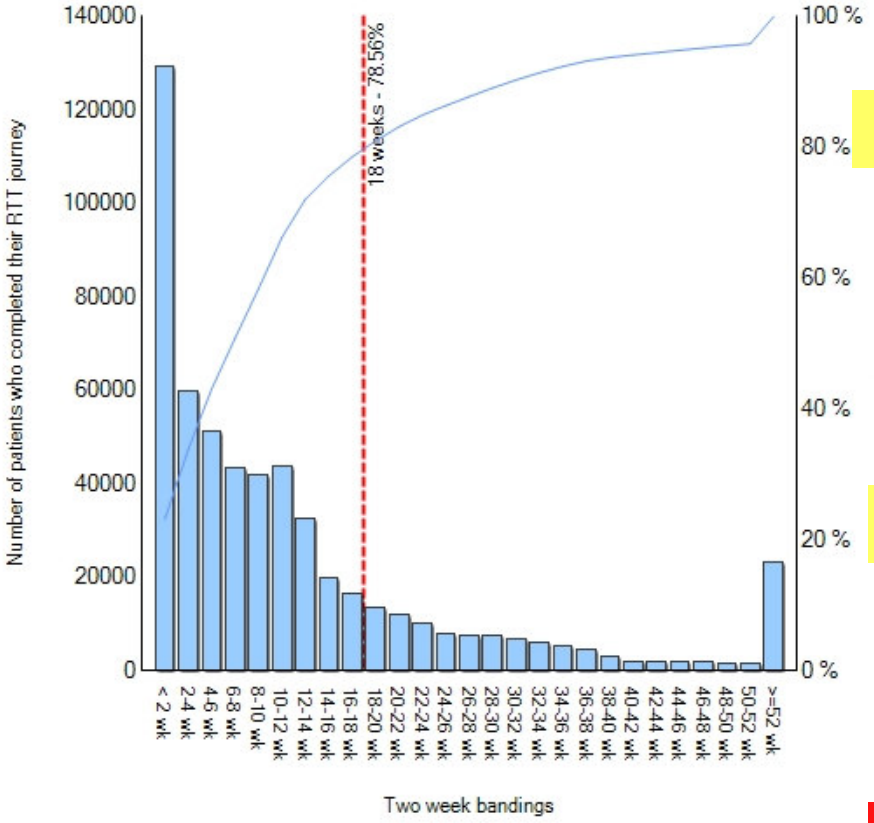


4 Hr. A&E Target: An A&E in England

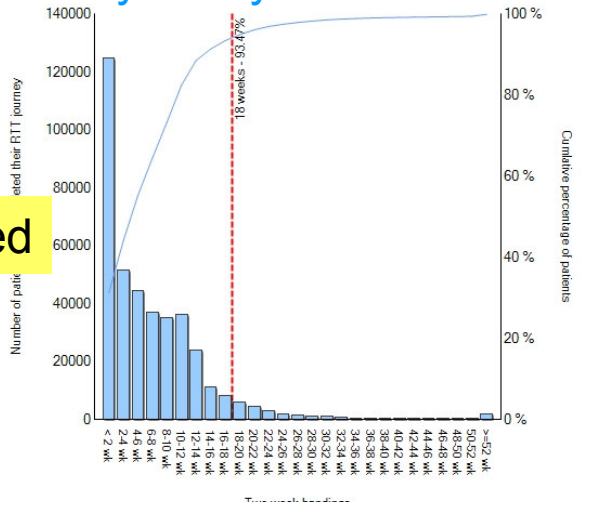


Referral-to-treatment: 18 Weeks

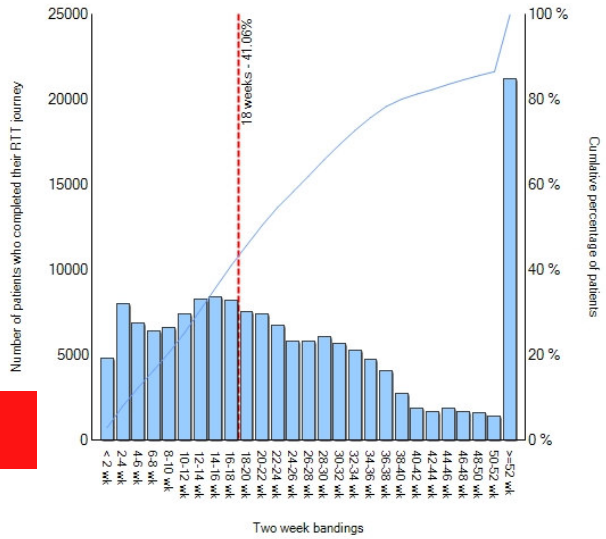
ALL Hospitals in England (Admitted and Non-admitted)
from NHS Institute's No Delay Achiever – Patient Journey Analyzer Tool
as of October 2006



Non-Admitted



Admitted



Why?

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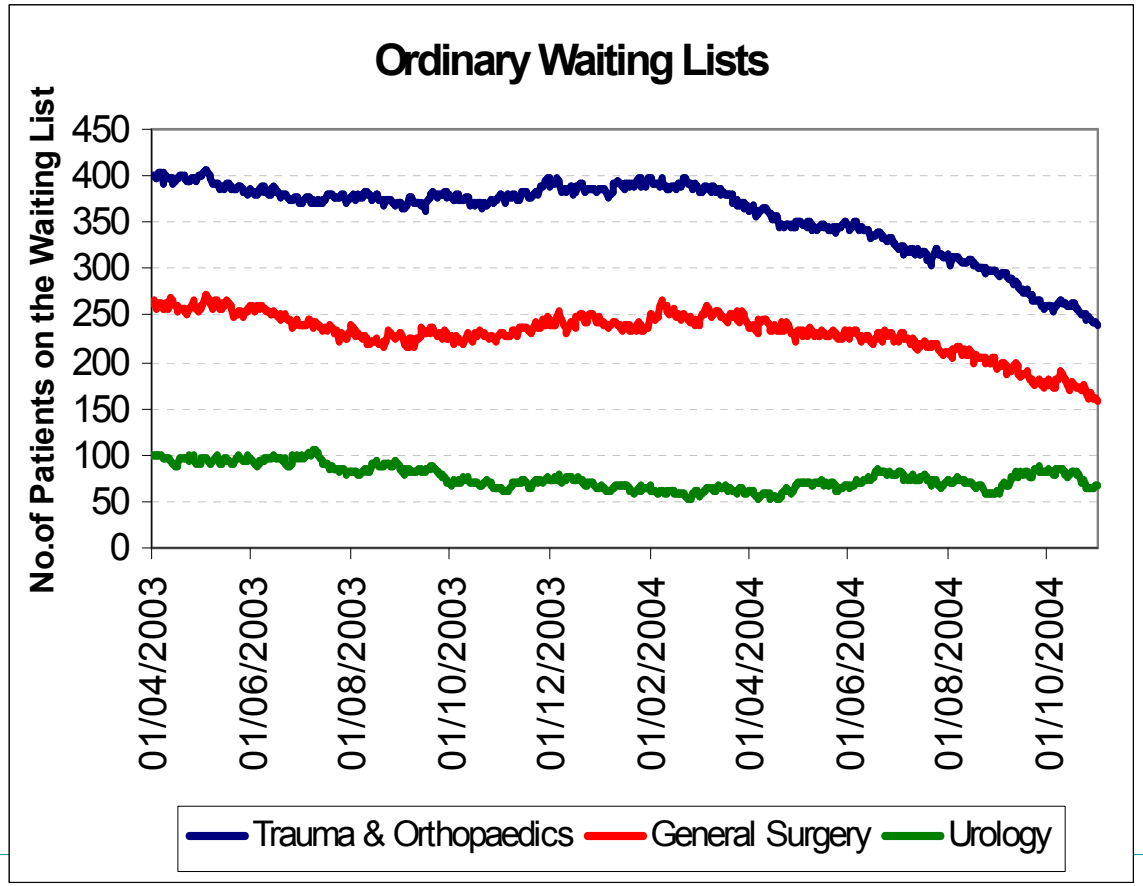
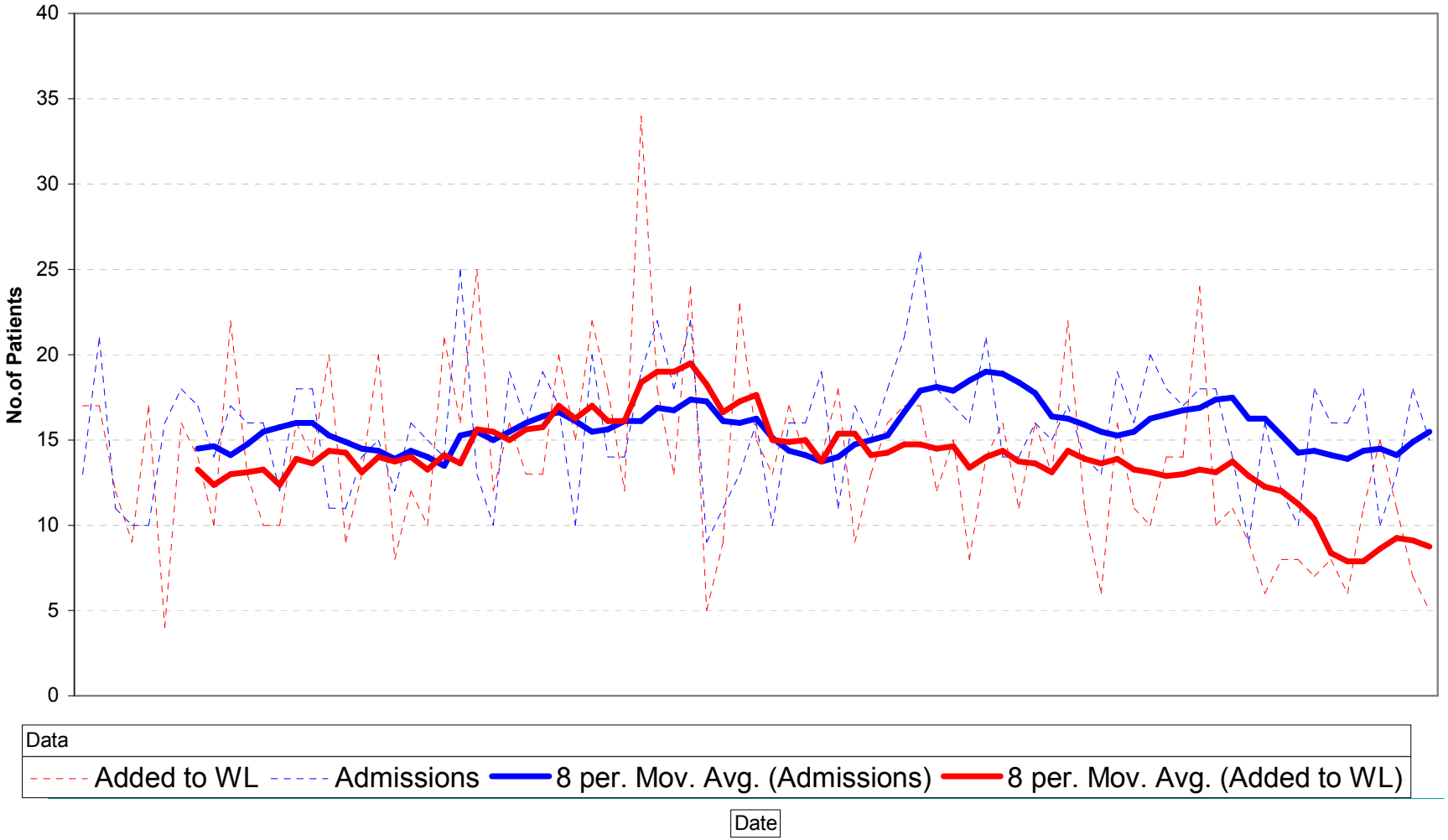
Waiting lists sizes

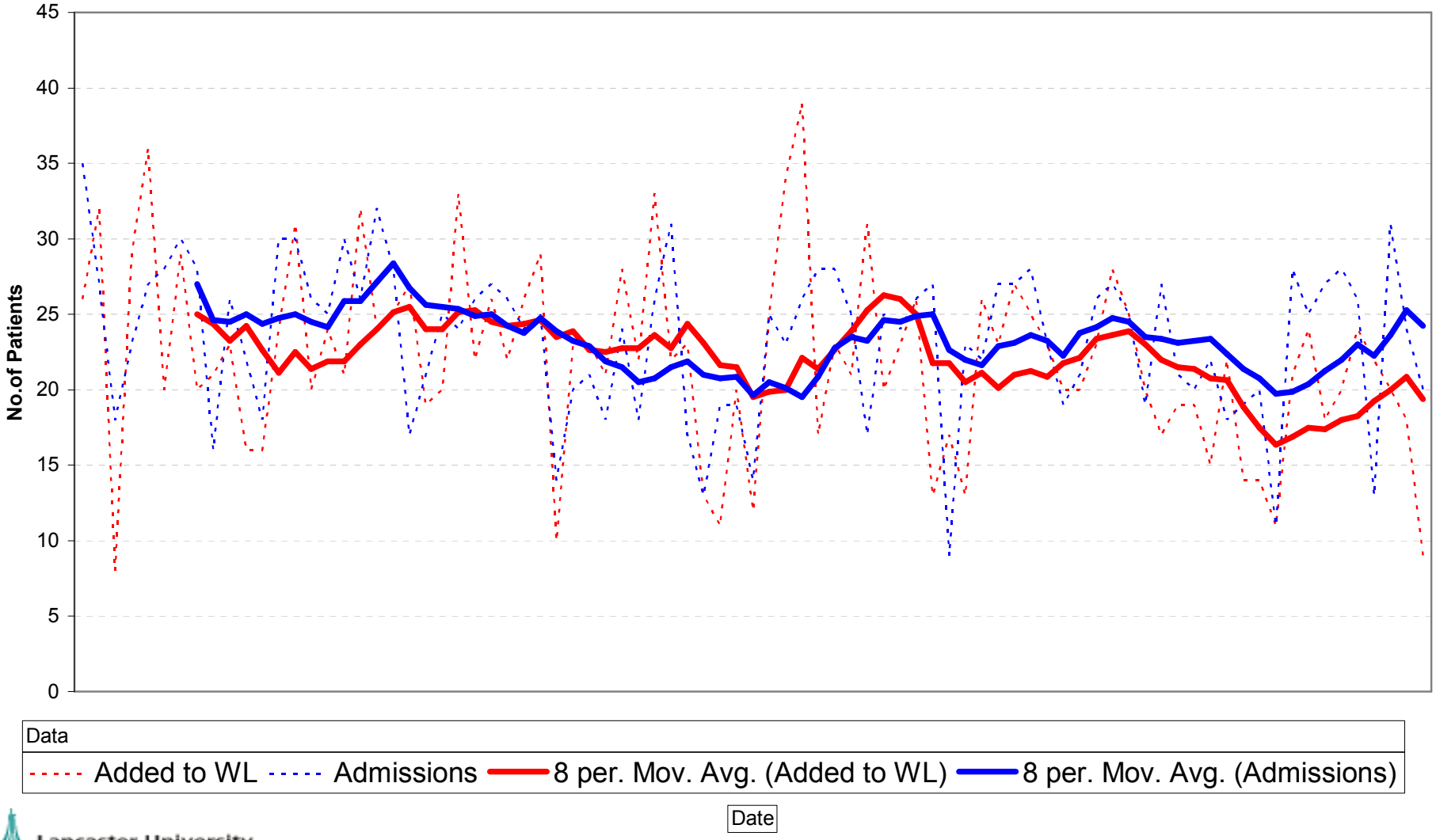
- A hospital's three specialties



Trauma & Orthopaedics



General Surgery

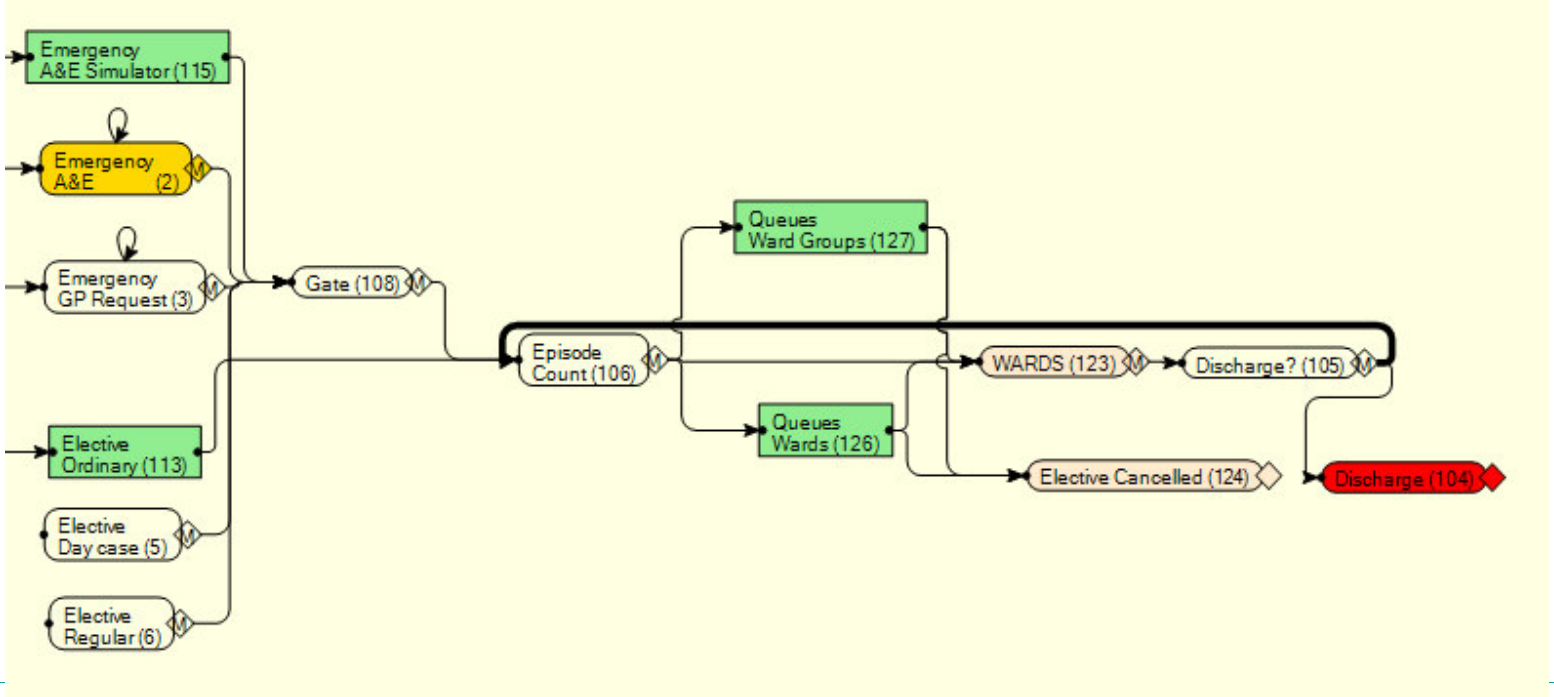


How to reduce backlog?

- Internal solutions (in-hospital)
  - Increasing capacity (beds, theatre sessions etc.)
  - Increasing throughput (shorter LOS, reduced DNA)
- External solutions (out-hospital)
  - Diverting patients elsewhere (private providers)
  - Demand management (process redesign, diagnostic tests by GPs etc.)

A detailed patient flow model

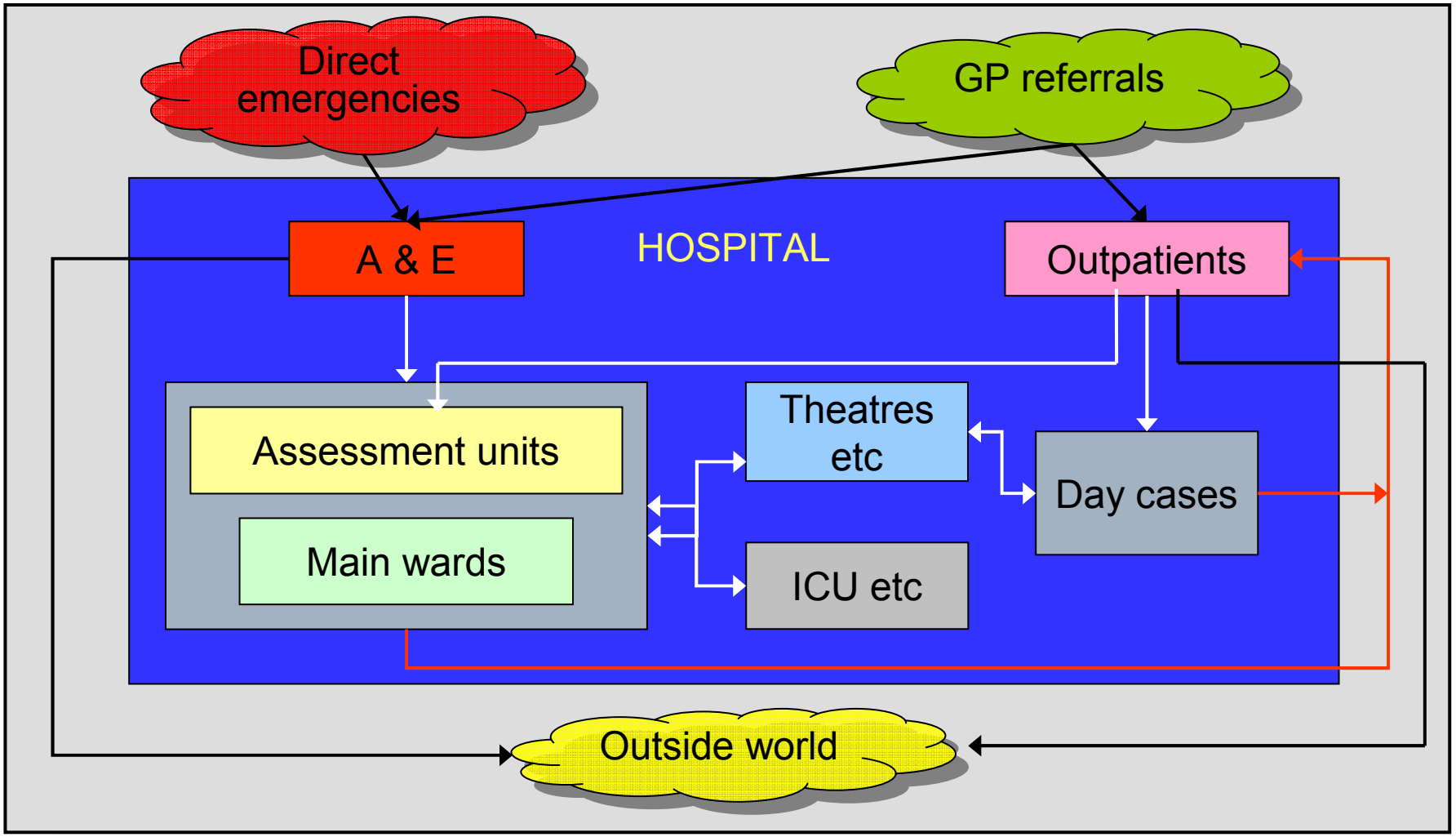
- Experimenting for different alternative scenarios and their effects on waiting lists;
  - More beds, shorter LOS, more Day-cases etc.



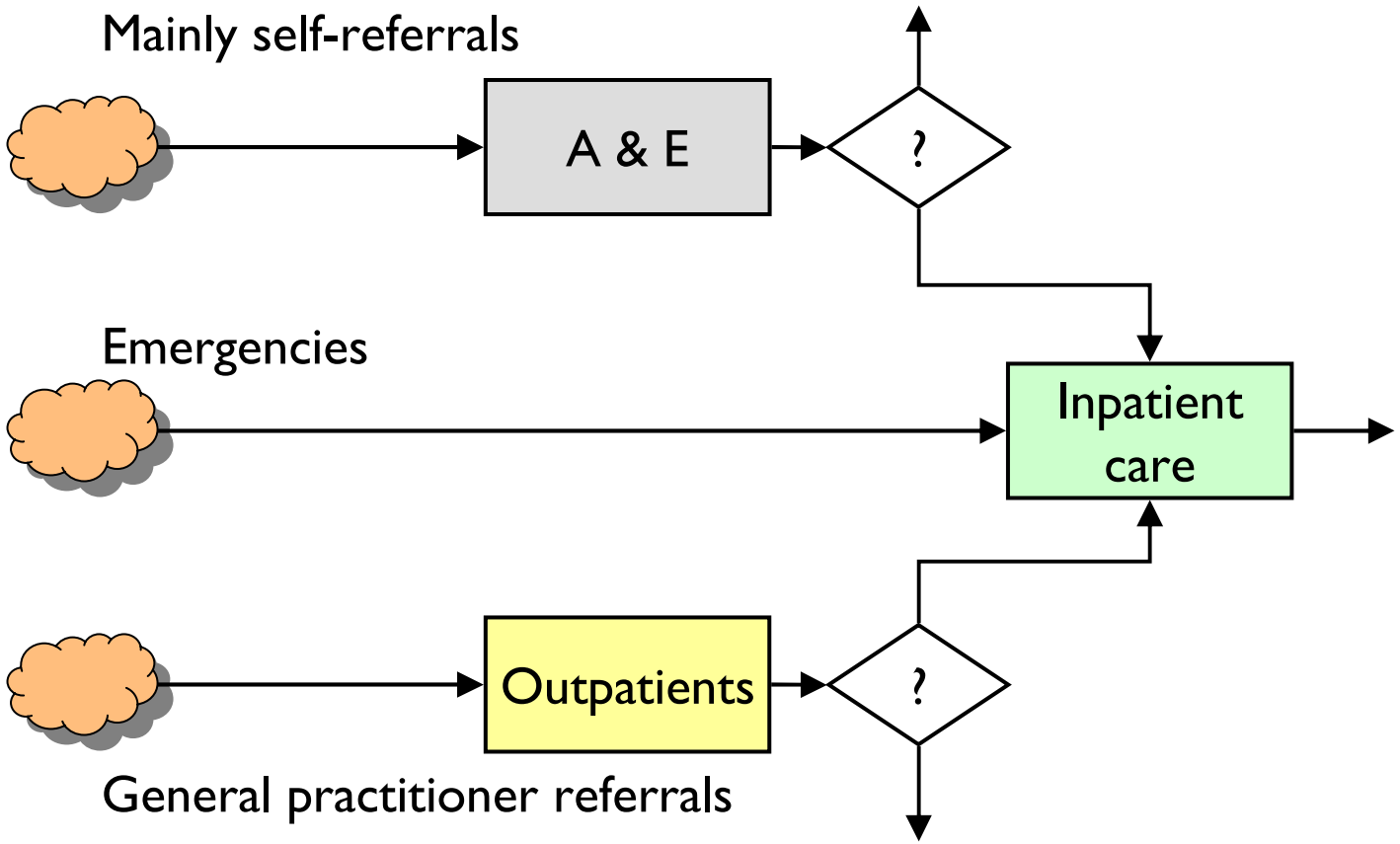
Thanks!

Extras

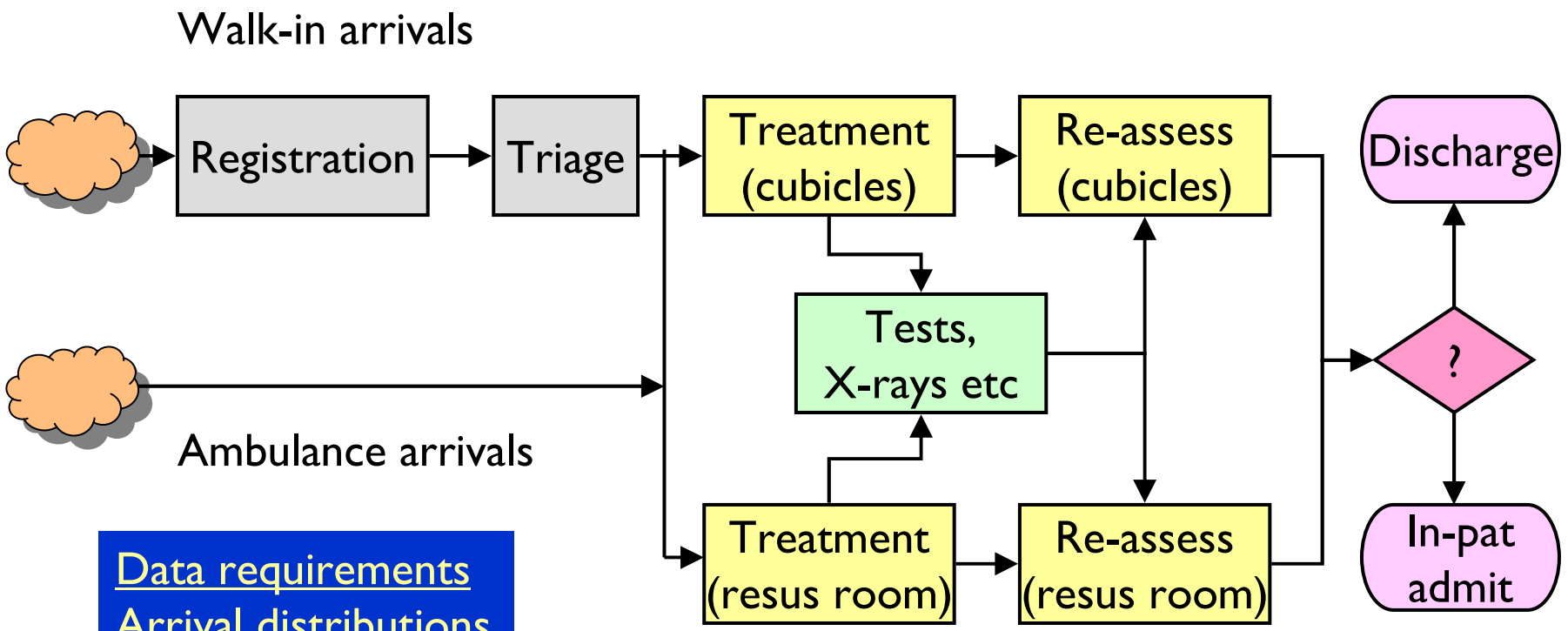
DGHPSim: conceptualisation



Plausible level of detail: 3 components

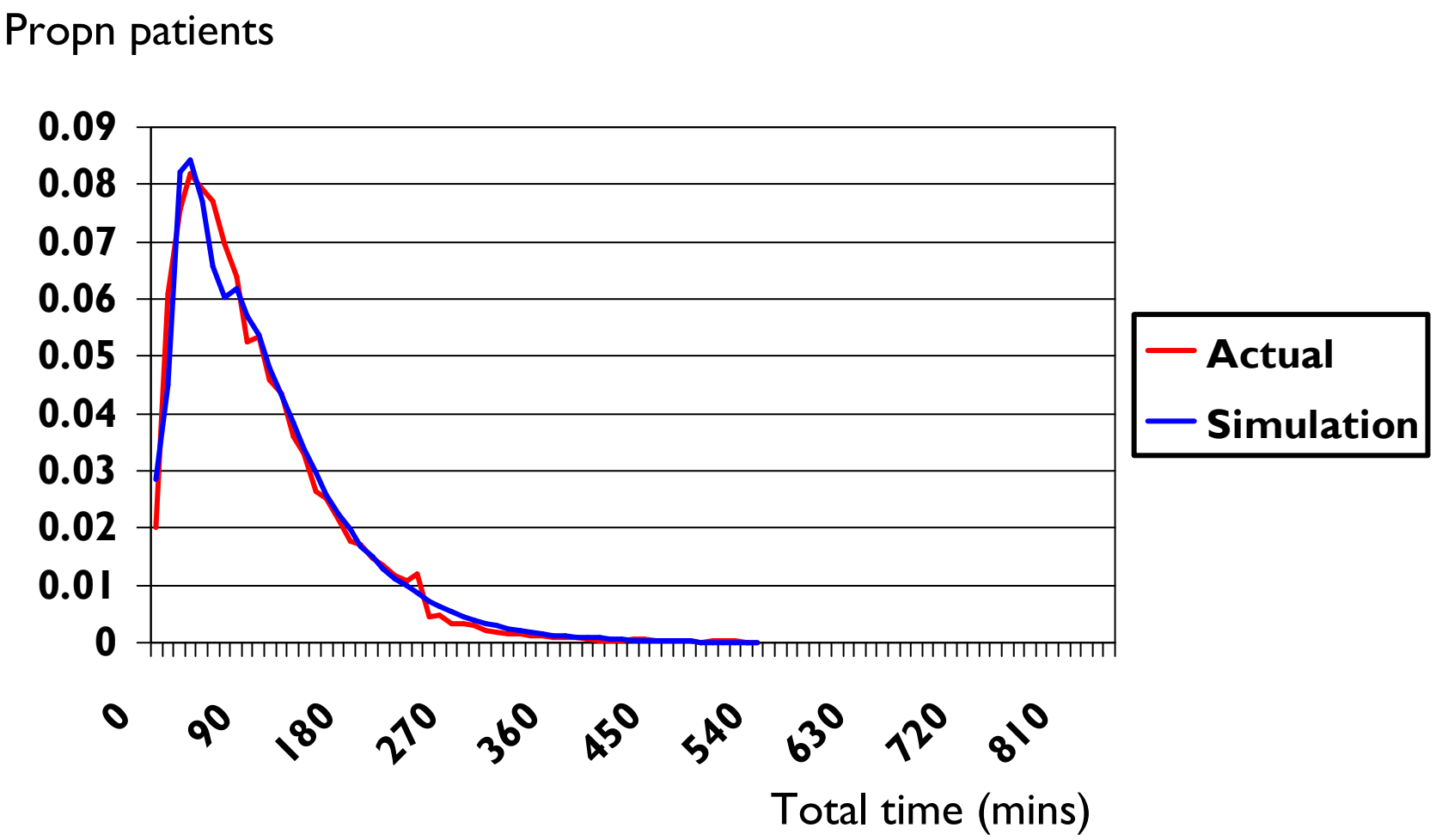


DGHPSim: A&E component

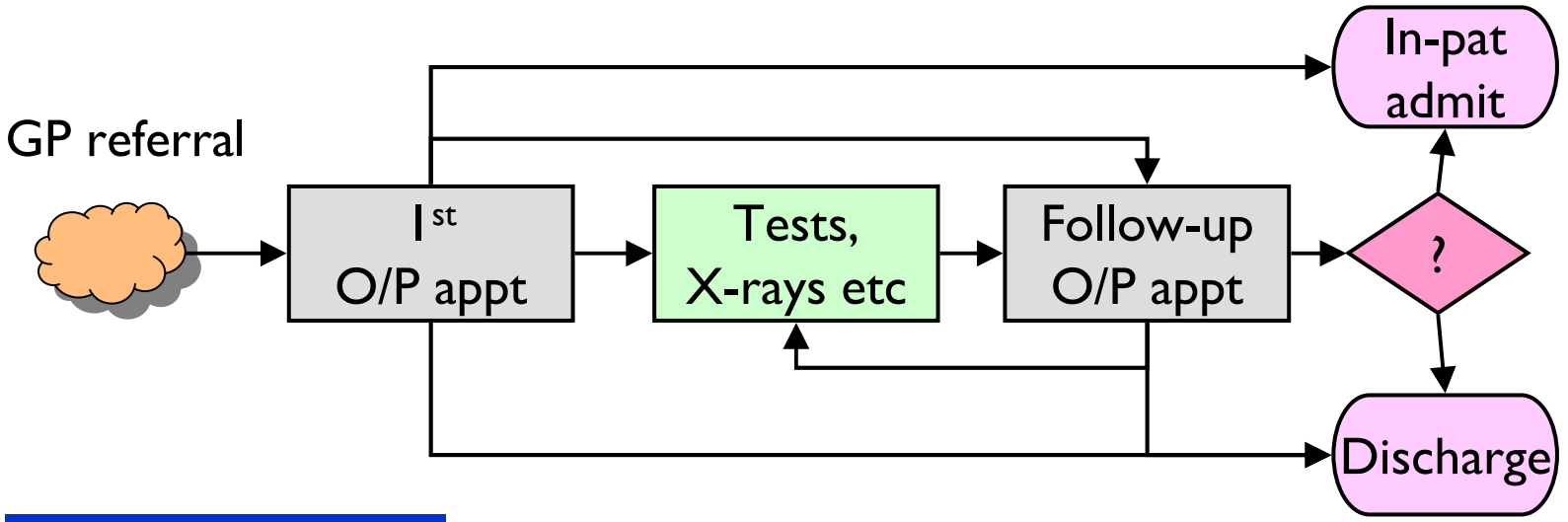


Data requirements
Arrival distributions
Arrival volumes
Service distributions
Staffing & resources

An aside on A&Es: 1: Royal Lancaster Infirmary



DGHPSim: outpatient component



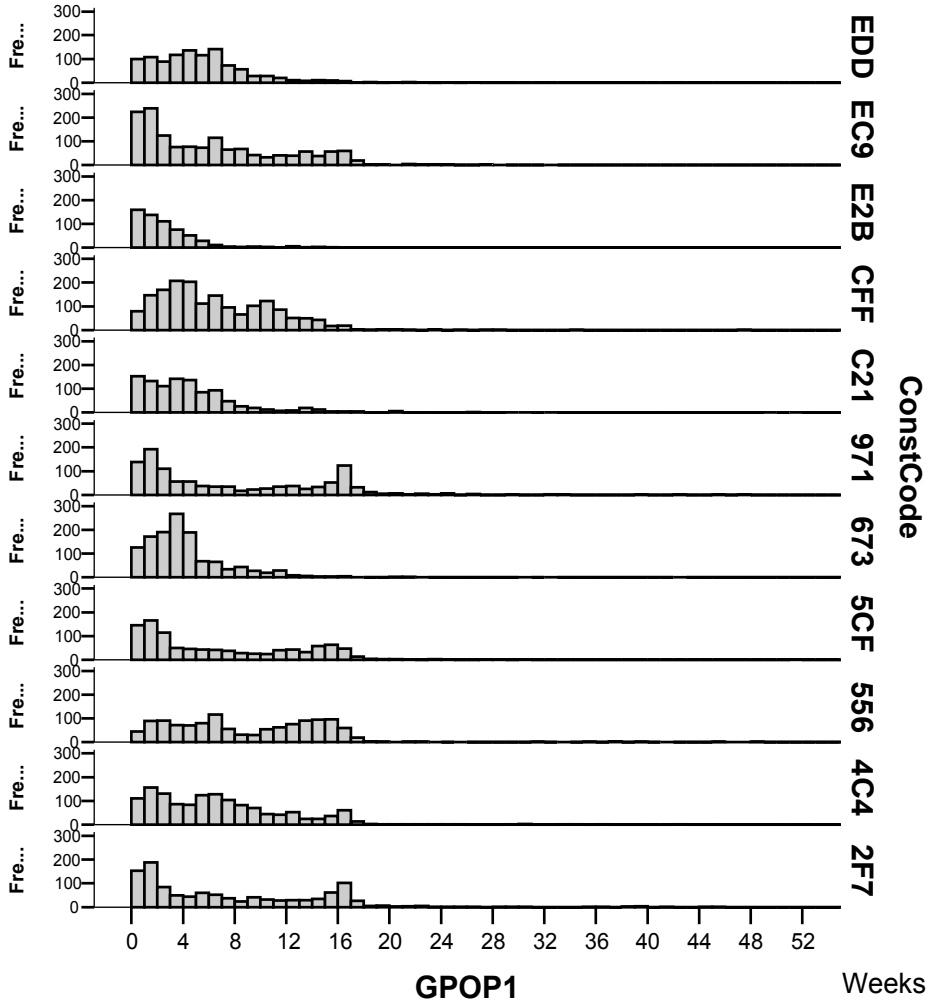
Data requirements
Clinic type
# of appointments
GP referral rates
Admission rates
..etc..

BUT …

Outpatient component – 2/3

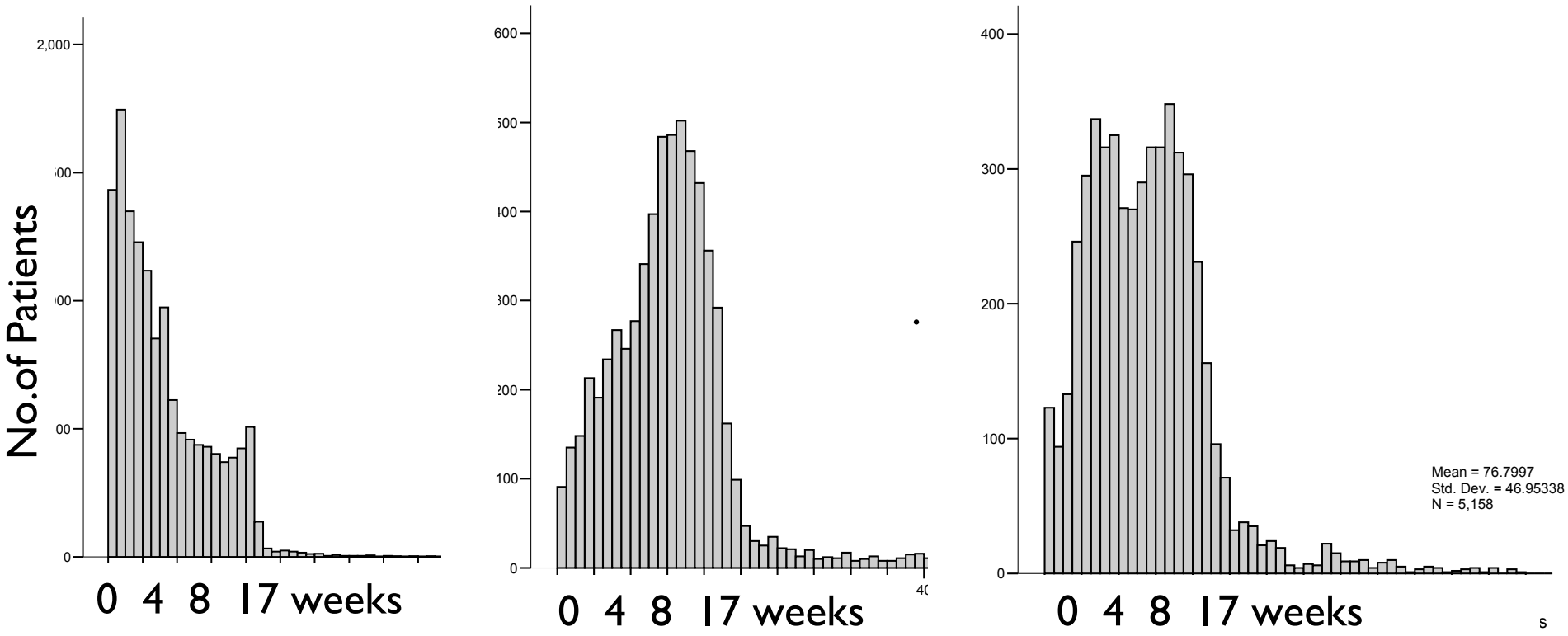
Difficult to generalize

- Consultants have their own waiting lists
- Specialties have different clinic types, eg. fracture clinics, audiology clinics, ointment clinics.
- Different clinical priorities



Trauma & Orthopaedics: Waiting for First Outpatient Clinic

Hospital A **Hospital B** **Hospital C**



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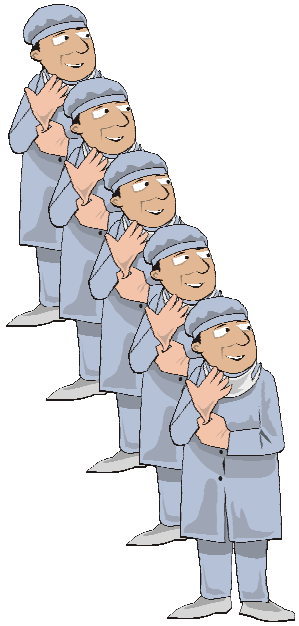
Outpatient component – 3/3

Use pooled waiting lists? Super specialties?

Consultants



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Super Specialty
[Trauma&Orthopaedics]

Attributes of

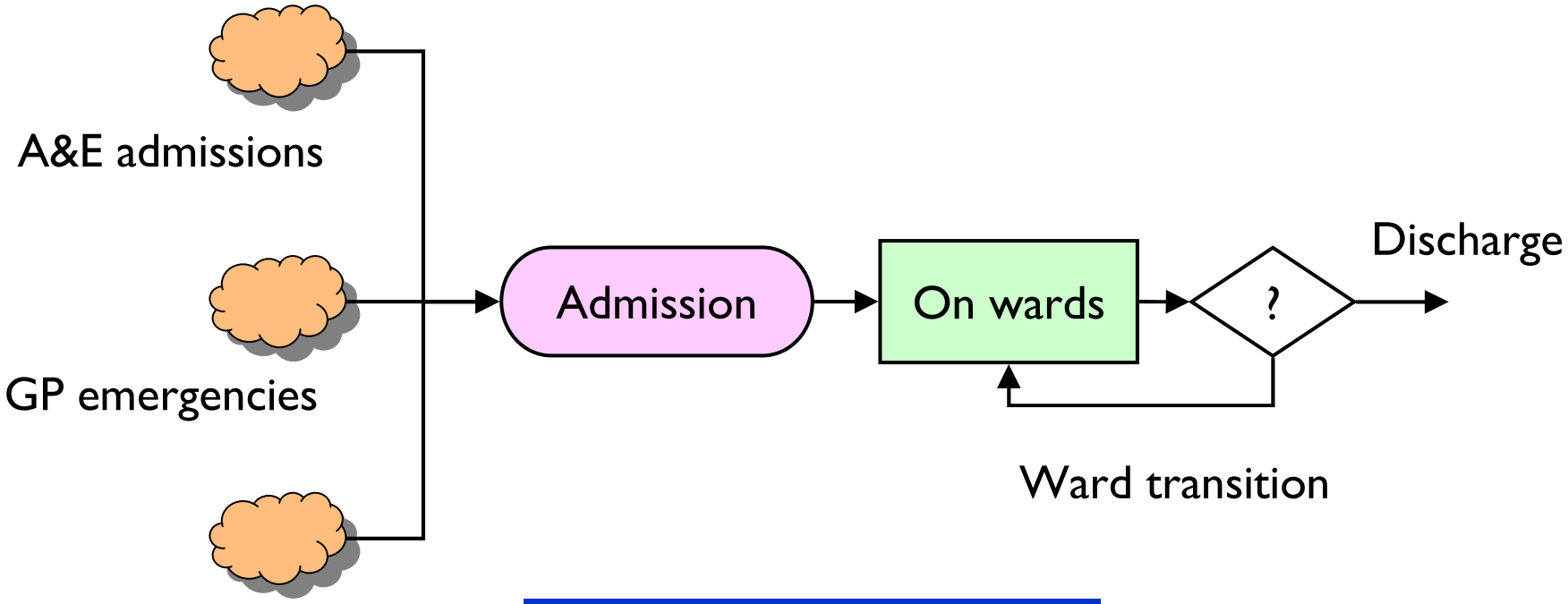
Super Specialty

- Number of Consultants
- Number of Clinics in a week
- Types of Appointments
- Duration of Appointments
- Priority rules

A consultant's schedule, such as

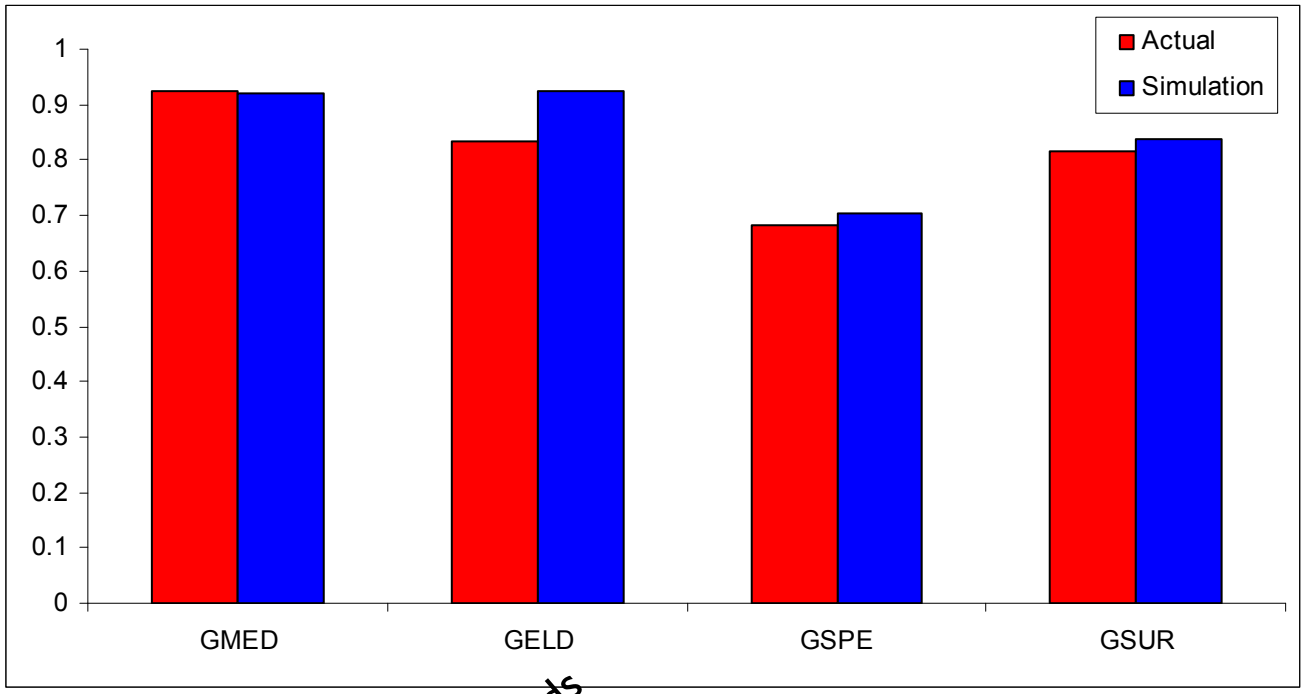
Consultant	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	0.5	1	0.25	0.25	0	0	0
2	0.75	0	1	0	0.25	0	0
3	0	0	0.5	1	0	0	0
4	0.5	0	0.5	0	1	0	0
5	0	0.75	0	1	0	0	0

Inpatient component



Data requirements
Lengths of stay distributions
Transition probabilities

Annual Ward Occupancies



Data sources

- A very rich source;
  - Hospital Episode Statistics (HES)
    - In-patient
    - Out-patient
- But still need local data for;
  - Ward transitions
  - Diagnostic test requests

Also need archetypes for elective admission decisions

Bringing it all together

- Can, in part, build generic simulations of acute hospital processes
- DGHPSim adopts a 3-part conceptualisation for evaluating waiting time performance
  - But note value in spotting gaming in A&E
- Objectives are obvious driving forces in determining "level of detail" in simulation models.
  - But models may have multiple uses, sometimes unanticipated
- No magic formula for model concepualisation
  - Value of flexibility
  - Importance of continued conceptualisation