

Success in a Changing Market: Innovation, Funding, Communication

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EUROPEAN CENTRE FOR HEALTH ASSETS AND ARCHITECTURE

Services to Capital Translation

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The hospital is a healthcare location which exploits **economies of scope** (but not economies of scale)

Economies of scope in treatment (especially for advanced work & complications):

- Surgery
- Imaging
- Diagnostics

Despite pressures to take all these out of the hospital into other settings

And meanwhile, hospitals serve other functions:

- Training of medical staff
- R&D
- Urban regeneration

The changing environment threatens the ordinary acute site. But “the hospital” as a concept will not disappear



If form follows function, what would **normally** be the form when (hospital) function is changing so fast?

Some options are the historic norm:

- Maintain (or even increase) the asset base of bed numbers (per 1000 population)
- Sweat the asset base by raising bed utilisation rates ($\geq 90\%$)
- Add medical technology in existing hospital specialties & departments



If form follows function, what **should** be the design principles for form when (hospital) function is changing so fast?

There may be a better approach:

- Develop & articulate models of care based on systematised care processes
- Treat such clinical pathways as **flows** for a patient across the system viewed as a *network*
 - multiple paths via nodes
 - non-linear
 - reversible
- Build the appropriate **capacity** for those flows

The methodologies are not yet there to prove this, in comparing one hospital in its setting against another



Clinical Pathways: the core concept

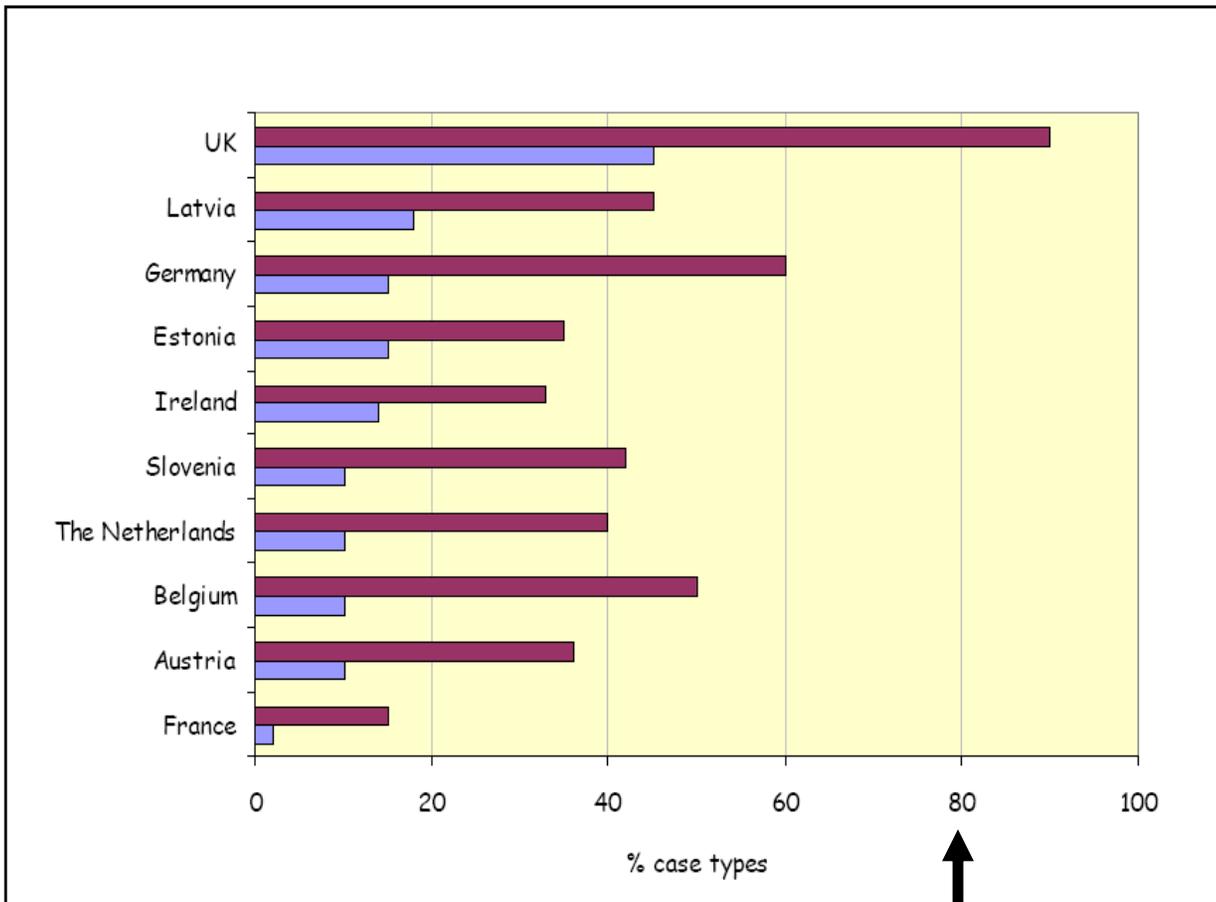
Integrated disease management/clinical pathways (“whole systems”) are:

- Fundamental to clinical & management improvement
- Essential input to service delivery (re)design
- Valuable if only as communication & learning mechanism
- Key to effective strategic asset planning
- Increasingly applied for large numbers of patients, especially chronic with co-morbidities
- Immediately applicable *within* hospitals, but possibly have most impact *across* settings

The confounding factor is that different elements of pathways are, or should be, delivered in other parts of the service, or in different services (social)



Clinical Pathways: actual penetration



Key: Bottom bar (blue) – actual
Top bar (red) – projected

Caution over reliability of these statistics! No country has reliable records

Source: EuHPN, Survey of Clinical Pathways and Strategic Asset Planning in 17 EU Countries, 2004

↑ A reasonable maximum?

Not there yet, but the direction of travel - & the potential - are clear



Learn from industry (1): two kinds of industrial process

Batch:

- At one time, all “manufactories” like this
- Craft industry still is
- Leads to intermittent flows
- Lots of hospital work is currently like this!



Flow:

- Edward Deming & Henry Ford assembly lines, & true process industries (minerals, hydrocarbons)
- Systematisation
- 80/20 rules of thumb
- Extends beyond hospital, before & after patient episode
- Hospital care to some extent is, & in the future should increasingly, be managed like this



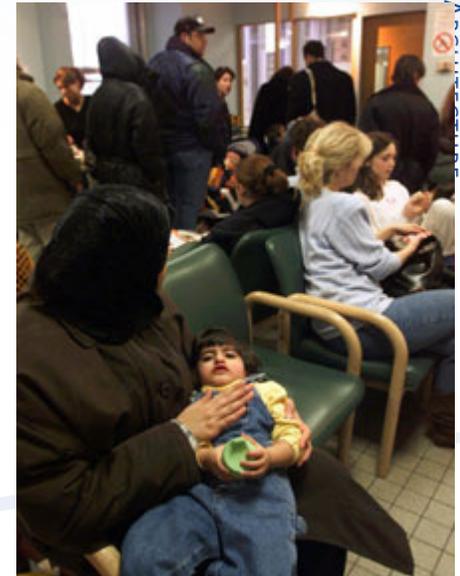
Lifts versus escalators: flow capacity is more forgiving than batch₇



Learn from industry (2): lean production

Production should never be a black box:

- More difficult in service industries (perishable product)?
- Every step should add value to customer (need to define who that is)
- Aim for “Zero defect” quality
- Align contractual relationships
- Minimise waste (money, time, materials, mistakes, unplanned readmission, inventory) rather than add technology, buildings, labour



Waiting rooms, & wards, are the ultimate inventory (patients' time has no cost)



The taming of the queue...

“Queuing theory”, quantifying and managing traffic flow, otherwise known as “Random customer demand meets fixed capacity”. Enjoy:

$$P=(\Lambda)^n e^{-\Lambda}/n!$$

which is *the Poisson distribution of probability of unscheduled patient arrivals in the next interval of time* (and there are plenty more equations like that...)

- Before obsessing about the maths, firstly manage patient flow problems by attacking *predictable peaks & valleys in workload*
- What is the *critical path capacity constraint*? It's almost **never** the number of beds (except maybe for rehab). Relieve one constraint, another will pop up (but so what?)
- *Service configuration* is more important than crude capacity



What is “flow”?

In the healthcare context, **flow** should:

- Group similar patient processes, not similar ailments
- Relate to the number of activities undertaken, not number of patients
- Be best grouped by complexity, not acuity
- Keep types of flow – patients, staff & goods – separate from each other
- Keep elective flows also separate from emergency ones (which are more predictable, statistically)

Question 1

How to measure? Pathways don't map to DRGs (which refer to individual admissions) nor “Consultants Episodes”¹⁰



What is “capacity”?

In the healthcare context, **capacity** should:

- Reflect that hospitals are immensely complicated processing plants
- Recognise both flow & batch processes
- Be limited by true network constraints which, like the poor, are always with us - & they're probably hidden
- Be structurally in excess, to cope with inevitably variable flows (seasonal 'flu...)
- Be loose-fit, & as standardised as possible

Question 2

How to measure ability to deliver network processes?
It's **not** counting singular, simple structures like beds



Conclusions

- Current healthcare systems largely treat patients in **batches**, and rely on “**waiting**” to balance the system
- **Clinical Pathways** will be the way to handle the majority of future healthcare needs, in & out of the hospital, for both clinical and managerial reasons
- Managing pathways is about handling **flows** (patients, staff, goods) efficiently across the network
- The **capacity** of a network is always more complex than a linear system, & is a function of (often hidden) choke points (in healthcare, very rarely bed numbers)

But in a hospital, a queue is a line of customers waiting to be severed...