Designing for Quality
26h ISQua International Conference
11-14th October 2009

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EUROPEAN CENTRE FOR HEALTH ASSETS AND ARCHITECTURE

"Investing in hospitals of the future"

Steve Wright

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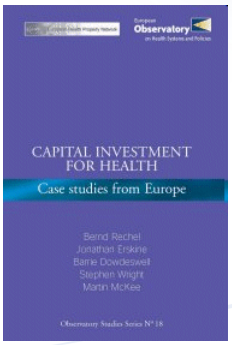

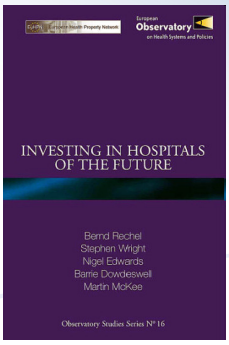

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2

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Btw It's a tough world out there: is this the Great Recession? 2009 vs 1929

Source: Eichengreen & O'Rourke

& with the ageing crisis (baby boomers) now almost on us. In this environment, keep investing. But, even more than before, get the capex decisions right…

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3

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For the study, why these two organisations?

- European Observatory on Health Systems & Policies:
  - 12 members from government, international institutions, academia, NGOs
  - Secondary research
  - Flood of evidence-based country/regional & thematic studies
  - The prime source of European health policy advice
- EHPN:
  - 12 members representing nations, international institution
  - Main European source on the *estate : services* interface
  - Information-sharing (still in EHPN)
  - Knowledge development & strategic advice (**now in ECHAA**)

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Context of the study

- The healthcare system is changing fast (the known epidemiological, demographic, technological, societal shifts)
- The acute (district general) hospital in particular is threatened from both sides (teaching hospitals ⇔ primary/intermediate care settings)
- Hospitals are expensive places – around 40-50% of national healthcare system costs passes through
- Social infrastructure is long-lasting (40-50 years?)
- **The estate is critical (in poorly-understood ways) to modern service delivery**

Question:
Given this context, how would you start thinking about good healthcare capital investment?

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The case studies

Hospitals or systems: Alzira (E), Coxa (FL), Martini Groningen (NL), Trondheim (NO), John Paul II Krakow (PL), Stockholm County (SE), Northern Ireland, Sittard (NL), Rhön Klinikum (D), Tuscany (I), PFI (UK)

Some results:

- Sittard - medical process systematisation, fully integrated care via IT, leadership
- Coxa - focused outsourced business "joint-replacement factory", PPP, leadership
- Rhön Klinikum – regulated privatisation, medical process systematisation, tight financial management
- Alzira - whole-population PPP, health targets
- Northern Ireland - integrated care model, large investment, PPP

Systematisation/care pathways, clinical & business models, PPP, clear strategy…

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6

Structuring the thematic book

3. Planning responsibilities 6. Market competition

[Context & demand factors]

4. Concept planning
5. Workforce
7. Financing
8. Lifecycle economics
9. FM
10. Community impact
12. Sustainability

2. Models of care ⟷ **11. Services:capital translation**

I'm going to pick out certain bits to be **bold** about during this morning (especially chapter 11)

7

Ch 7 Procurement & financing models

- Risks & exposure created by different procurement methods vary – especially with concessions
- Often in the past there were only soft budget constraints
- Finance by traditional methods (public sector equity & debt) is being supplemented by new funding methods (EU grants, PPP):
  - EU Structural Fund grants:
    - ERDF (infrastructure) & ESF (soft)
    - Now specifically written-into SF protocols
    - Responsibility shared somehow between DG-REGIO & DG-SANCO
    - If <2% of SF monies goes to healthcare, why is this less than the 9% share of healthcare in GDP?
  - PPP:
    - Different scopes: accommodation, accommodation + clinical, whole-population, regulated privatisation – a question of setting the envelope
    - PPPs don't generate new funds (just a different sort of debt)
    - Contracts try to be "complete" but fail because of transaction costs, so should instead be aimed at "contingent adaptability" & trust between partners

8

Ch 8 Life-cycle economics

- Costs of capital:
  - Are small (relative to total of annual maintenance)
  - Very small (relative to total of annual medical service expenditures)
  - But the capital stock determines *in part* both of these larger flows
- Acceptable functional life is far less than technical life for most elements of health buildings
- "Layers" model indicates for hot floor (24-46%), office (36-24%), hotel (27-21%), factory (13-9%):
  - different costs/m² to build
  - different functional lives ("Service Life Periods")
- Design adaptability depends on:
  - Elements with different SLPs having minimum friction between them
  - Foundations, roofs & main technical systems having maximum technical lifetimes
  - Inner parts (ceilings, partitions…) being alterable

9

Ch 11 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, & despite pressures to take all these into other settings):

- Surgery
- Imaging
- Diagnostics

And meanwhile, hospitals also serve other scope functions:

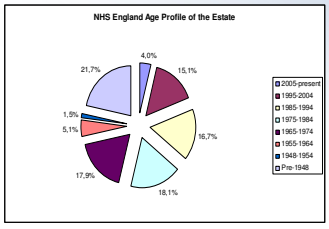
- Training of medical staff
- R&D
- Urban regeneration

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

10

Ch 11 (cont.) What strange facilities hospitals are…

- Over a fifth of English NHS estate is >60 years old – but still somehow used
- The capital stock concerned must be fully depreciated
- Few other industries have (or want) capital stock this old
- **It implies that acceptable capital:labour ratios in healthcare can be dramatically variable (how?)**



Good medicine can be delivered in ancient monuments – but is it desirable?

11

Ch 11 (cont.) Now let's go to bed…

- Hospital capacity is a mix of buildings, medical & diagnostic equipment, operating theatres, ICUs…
- In practice, however, it is almost universal to denominate it in terms of **certified or manned beds**, forecast:

$$\text{Bed numbers} = \frac{\text{Population} * \text{Hospital admissions frequency} * \text{ALoS}}{\text{Occupancy rate} * 365}$$

- This formula substantially **drives** the capital planning process for hospitals in most healthcare jurisdictions
- Something similar is used for operating theatre capacity
- But other hospital functions are not integrated

The "bed" as a function is mostly storage – warehousing of patients while the institution works out what to do with them

12

Ch 11 (cont.) And what **should** be the design principles?

There may be a better approach than "beds":

- 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 processing ***network***
  - multiple paths via nodes
  - non-linear
  - reversible
- Build the appropriate ***capacity*** for those flows

Methodologies (or data) are not yet there to do this, for a hospital in its setting

13

Ch 11 (cont.) 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 flow? Pathways don't map well to DRGs (which refer to individual admissions) nor "Consultants Episodes"

14

Ch 11 (cont.) What is "capacity"?

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

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

Question 2
How to measure the ability to deliver network processes?
It's not counting singular, simple structures like beds

15

Soundbitten! Overview of the study major conclusions

- A strategic response to context is vital
- Planning is still a policy lever; don't rely just on market forces
- Link capital funding to desired design (not vice-versa)
- Flexibility is critical across the site, & through lifespan
- Life-cycle approach to economics
- Consideration of wider community impact
- Therapeutic design – for staff as well as patients
- Sustainability
- Whole systems perspective
- Hospitals should be planned as complex flow networks

Thank you!

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