4th European Conference on Healthcare Engineering
Paris, 30th May 2011.

An evidence based view of the future outlook for capital asset strategy for healthcare in Europe

Barrie Dowdeswell
Director of Research

European Centre for Health Assets and Architecture

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Health, a defining societal value

Health, a defining societal value

Health facing increased pressures

Population health status
The macro view

Personal care
The citizen

- Citizens rights:
  - principles of equity and social cohesion healthc

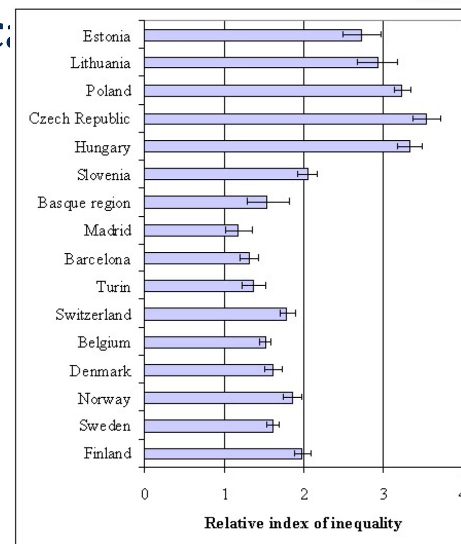
principles of equity and social cohesion

- Severe economic pressure
  - Credit crisis and its aftermath

Severe economic pressure

Credit crisis and its aftermath

  - Age gap pensions crisis



Avoidable mortality

Schrijvers C (RIVM), Kunst AE (EUR-MGZ), l (RIVM).
Relative index of inequality (RII) for all avoidable mortality in selected countries.
EUphocus\ Health Inequalities, 29 May 2008.

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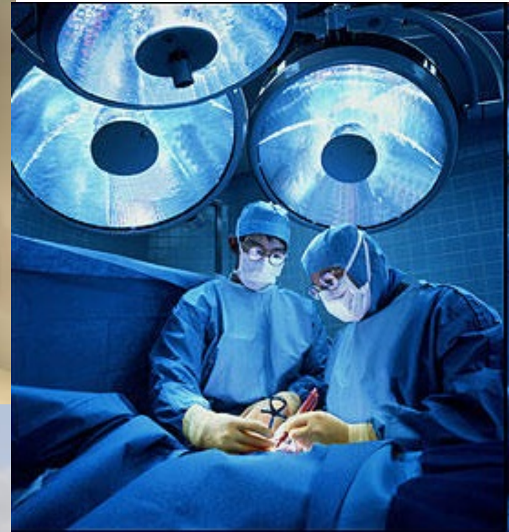
The popular view of healthcare



Another view of healthcare - Ageing

Ageing with dignity

De Rietvinck, Integrated Housing and Elderly Care

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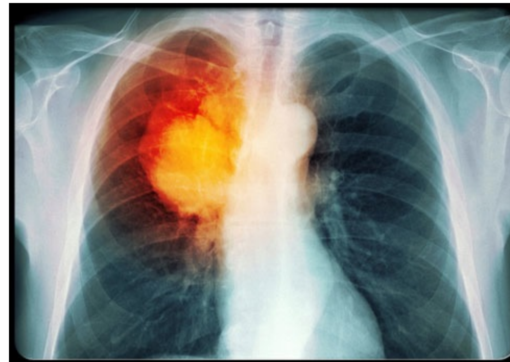
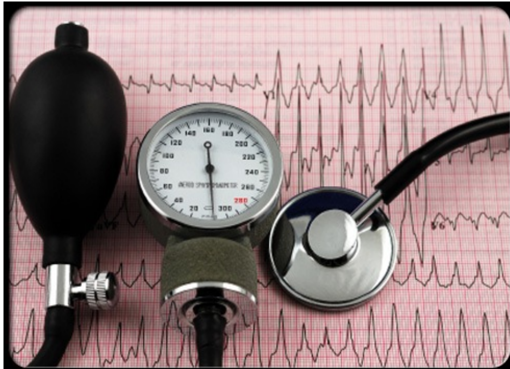
and another – Chronic Illness





- Society has become expert in the production of chronic illness
- Leaving intervention too late is in part the main contributory factor in sustaining an expensive hospital-based model

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The problem for Europe – reconciling

The problem for Europe – reconciling

- The current healthcare model and levels of spending were developed
  -

in the 70s, 80s and 90s – significant growth in GDP (12) the more we had,

Current cost pressures are now exceeding projected GDP growth levels - and probably for the next decade.

The options

Current cost pressures are now exceeding projected GDP growth levels - and probably for the next decade.

1. Rationing services and cutting health care spending will make the problems worse
2. Raising additional revenue does not look possible

problems worse

Rationing services and cutting health care spending will make the

3. Implementing structural reforms that improve the health sector's productivity and responsiveness and economic sustainability

- 1 & 2 have been tried and usually fail or prove unsustainable.
- create the climate and opportunity for change

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significant pressure – how should we respond

- **EU structural aid funds – under threat**

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economic factors = 50% fall 2009 - 2010
Capital and technology investment - curtailed by current

- **Capital and technology investment - curtailed by current economic factors = 50% fall 2009 - 2010**

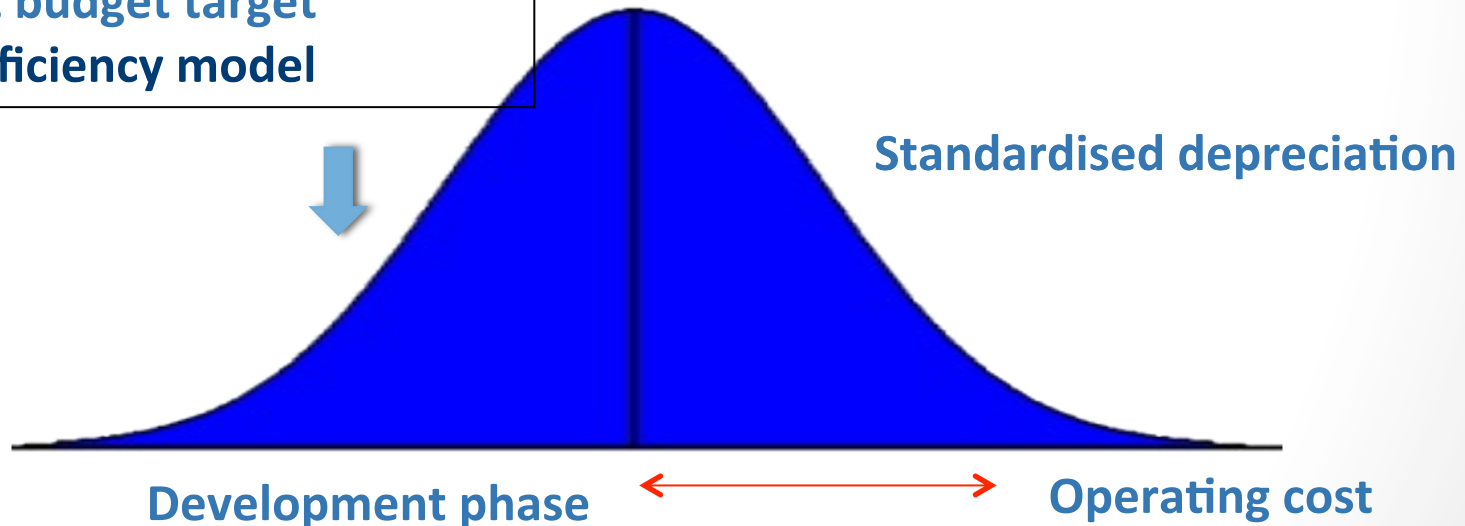
"£500m slashed for new hospitals and NHS refurbishment as spending cuts bite"

Impossible d'afficher l'image. Votre ordinateur manque peut-être de mémoire pour ouvrir l'image ou l'image est endommagée. Redémarrez l'ordinateur, puis ouvrez à nouveau

The conventional approach to project planning is looking unfit for purpose

Project proposal

- Optimistic demand forecasts
- Normative bed ratios
- Speciality configuration
- Performance targets
- Building and cost guidelines
- Project budget target
- **Cost efficiency model**



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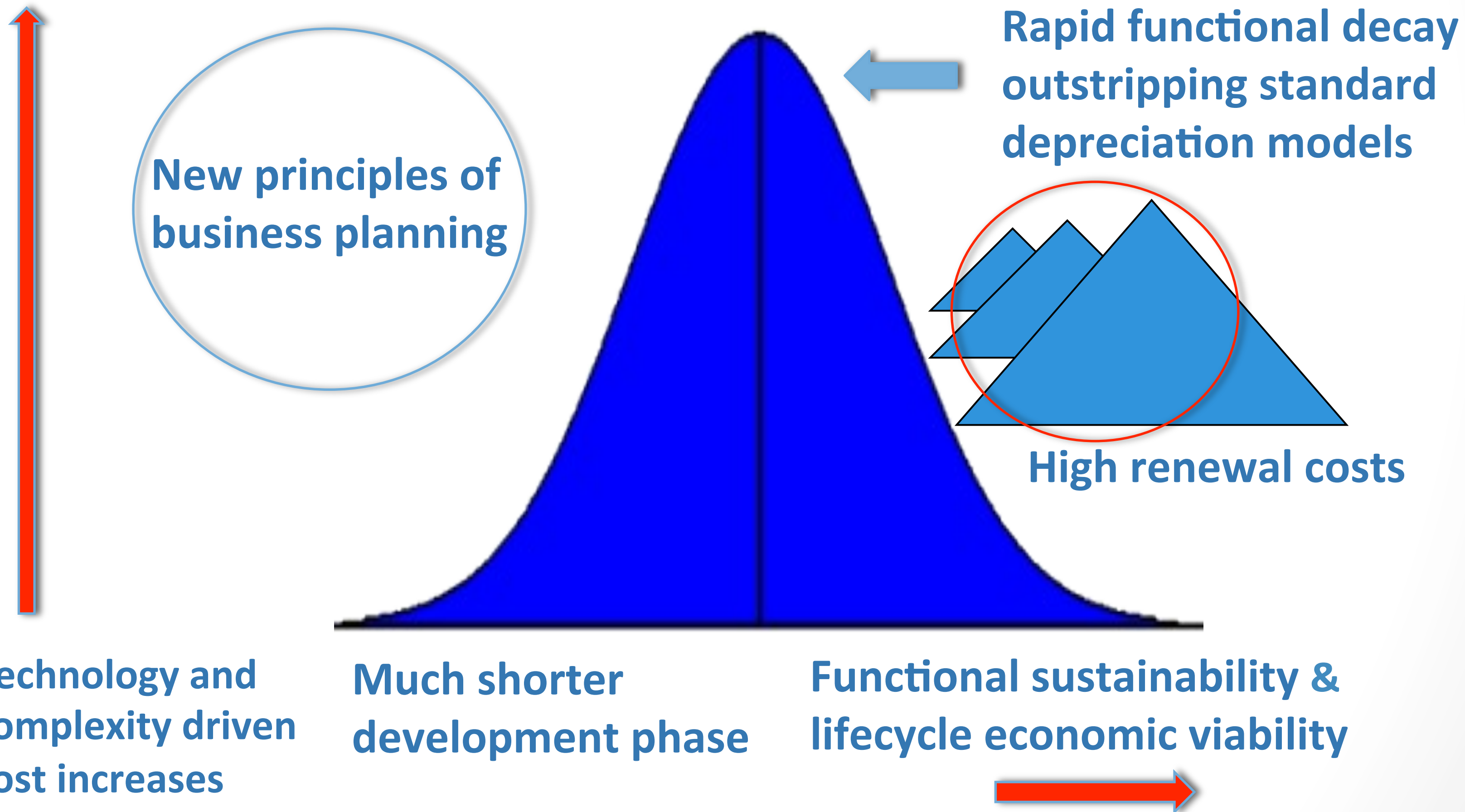
The future – investing during uncertain times



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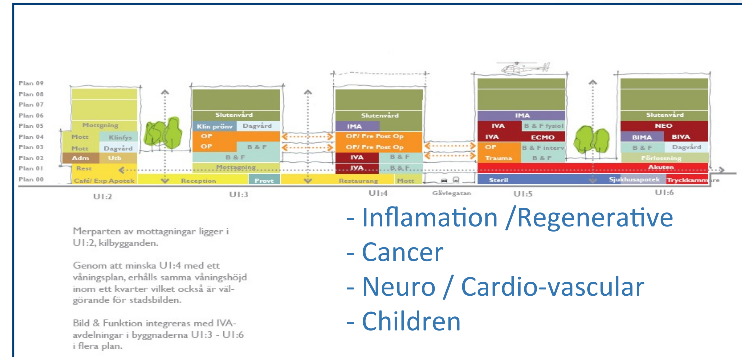
‘Commercial’ business principles

- Rapidly changing demand
  - New models of care
  - Technology diffusion
  - New specialty / adaptable design configurations
- Competition - risk management
- Variable income flow
  - Debt management
  - Workforce volatility
- Patient and professional safety
- Economic sustainability



Rate of return

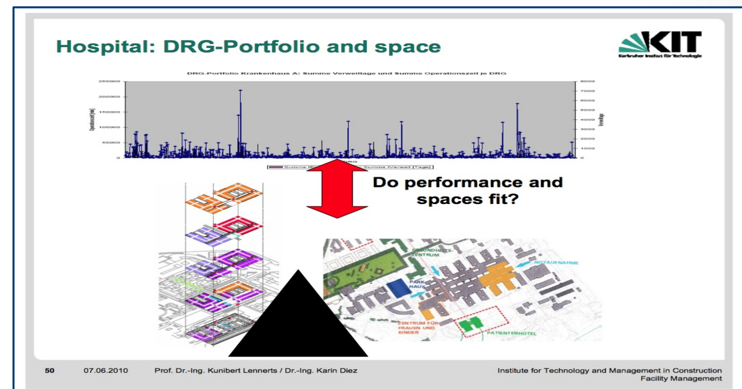
Step 1 2 3 4 5 6

	Monolith *	Extreme	Hotel	Hot floor	Office	Industry
gross floor area (m²)	46.075	46.075	12.923	11.372	16.270	5.510
building costs (mln.)	68,0	63,4	17,5	19,0	17,7	9,3
investment costs (mln.)	99,1	92,4	25,4	27,7	25,7	13,6
life span (yrs.)	40		50	20	50	20
Internal Rate of Return (IRR)	6,00%		7,49%	6,92%	7,47%	7,33%
increase return			25%	15%	25%	22%

* = for comparison the gross floor areas are equal and the monolith costs 7% more

Layers design

Price level February 2007, exclusive of VAT and premises



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Rethinking capital strategy

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EU wide convergence on common issues

- **Affordability – the impact of the credit crisis and beyond**
- **Ageing**
- **Chronic illness**
- **Technology development and diffusion**
- **Personal and professional expectation**
- **Workforce mobility**
- **Carbon footprints**
- **Health equity as a core element of social cohesion**

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Common patterns of change

- **Moving to economically more sustainable models**
- **Facilitating innovation and applying new technology as a driver of change**
- **Making health systems more patient-focused and less provider-centred**
  - **Strengthening primary care and reducing the unnecessary demands on the hospital sector**
- **Governments moving to a more exclusive ‘insurance’ role**
  - **Improving the effectiveness of commissioning / purchasing**
- **Government withdrawal from direct provision of healthcare**
  - **A wider range of more independent service providers to improve standards and promote efficiency**

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The healthcare sector – the hospital centric debate

- **Healthcare makes a difference**
  - **50% of the increase in life expectancy in recent decades - a result of improved health care**
  - **There are secondary economic benefits**
- **The EU - a hospital-centric model of care**
  - **Expensive – between 35% and 70 % of total health spending**
  - **'Lock-in' impact on models of care**
  - **Evidence is challenging the 'primacy' of the hospital model**

The current model looks increasingly unaffordable & unsustainable

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The value of capital investment
What are we trying to achieve?

- Populism and politics – the trophy hospital?
- Can we relate new capital spending to:
  - Better clinical outcomes
  - Contribution to improvement in population health
  - Reducing health inequalities
- Do we place a measurable value on the investment
- Do we understand the risks and opportunity costs

Much of the past decades of capital investment based on unsustainable debt

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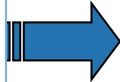
Has 'new' capital investment made a difference ?

Short-term - tactical

- Manifesto performance
  - Waiting times
  - Patient safety
- 'Modernisation'
- Public & professional expectation
- Frontier medicine

But

- Largely linear & incremental



Longer-term - Strategic

- Widening health inequalities
- Slow to respond
  - Chronic ill
  - Elderly
- Poor planning
- Limited technology diffusion
- Economically unsustainable
- Opaque 'health impact'

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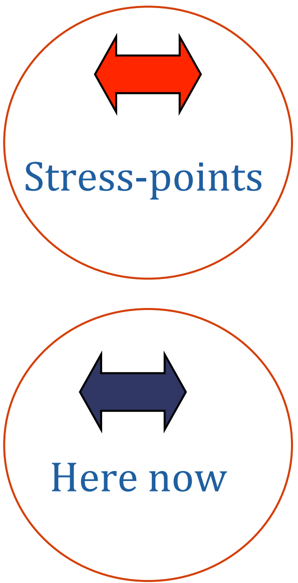
The dynamics of change



Increasing importance

PPP

Hospital

and community investment

Hospital

Compression impact

Healthy ageing

Hospital

Public Health - 1950

Care 1950 -

Chronic Illness 2005 -

Aged Care 2015 -

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Chronic Illness

Chronic Illness

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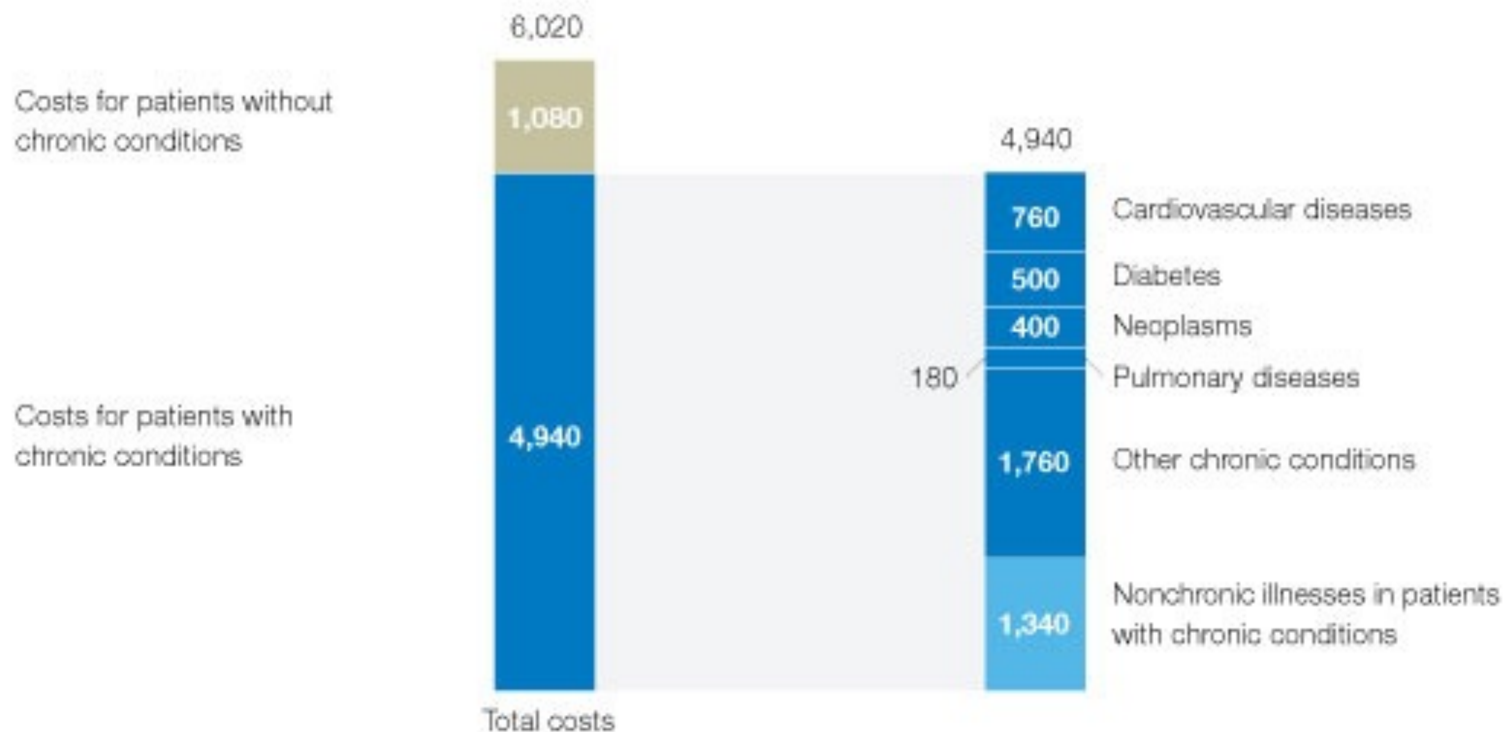
Chronic illness



[1] Statutory health insurance (public payor).

Changing the location and focus of investment

Patient centred interventional support

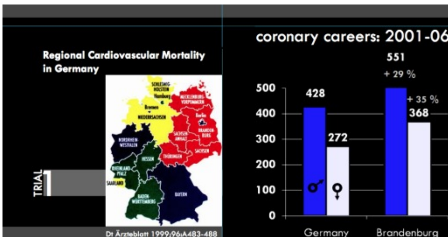
Transformational investment

Current bias towards curative investment

Diet **Smoking**

Treatment

Death



integrating the master plan in investments at regional and local level

illustrating examples:

close to home medicine

close to home learning

TRIAL 3

The Sheltered Way

Technical and organisational network structures for cardiological processes

A Feasibility Study

by order of Ruppiner Kliniken GmbH

K.J.G. Schmailzl

FONTANESTADT NEURUPPIN

›Regionaler Wachstumskern‹

regional center of growth

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Ageing - we often adopt a selective approach to the evidence

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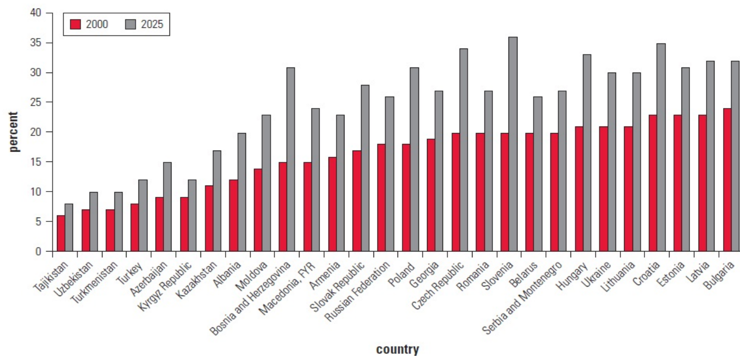
The impact of an ageing population

2010 - 4 to 1

2050 - 2 to 1

Ratio of working population to elderly retired



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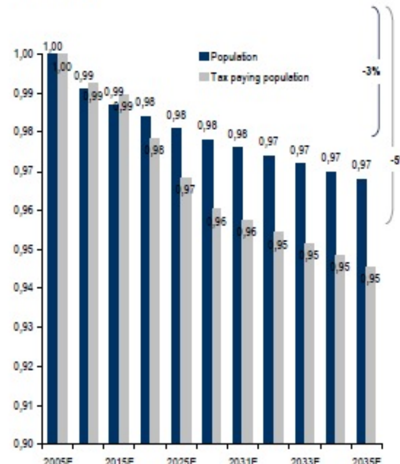

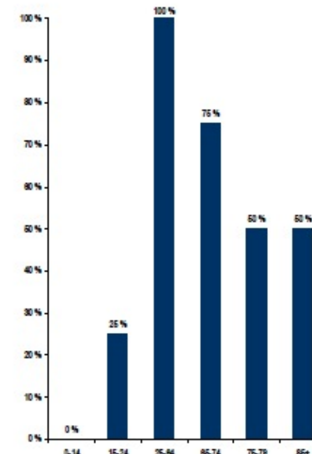

Kymenlaaso Region, Finland

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Neurological degeneration – changing focus

Incidence - between 1.1% and 1.3% of all EU citizens.

- **by 2050:**
  - **Figures will double in Western Europe, and**
  - **Treble in Eastern Europe**
  - **Without action citizens with dementia could represent between 25% and 35% of future hospital populations**

"People should not suffer from Dementia, they should be supported to live with it, it is a normal part of ageing"

Britt Ostlund, Lund University

Architecture as a medicine

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Ageing and healthcare costs - evidence vs assumption

- **Assumption – age related healthcare costs will increase very significantly - but**
- **Studies tend to contradict this when distance to death, or life expectancy is controlled for:**
  - **Ageing seems to explain only 0.5%-0.7% of growth in health costs**
  - **Cumulative health expenditures for healthy elderly individuals are similar to those for less healthy individuals of all ages**
- **The answer would seem to be:**
  - **Compression of mortality – reduction in predominant illnesses – Heart Disease and Stroke**
  - **Compression of morbidity – reducing the incidence and delaying the onset of disease**

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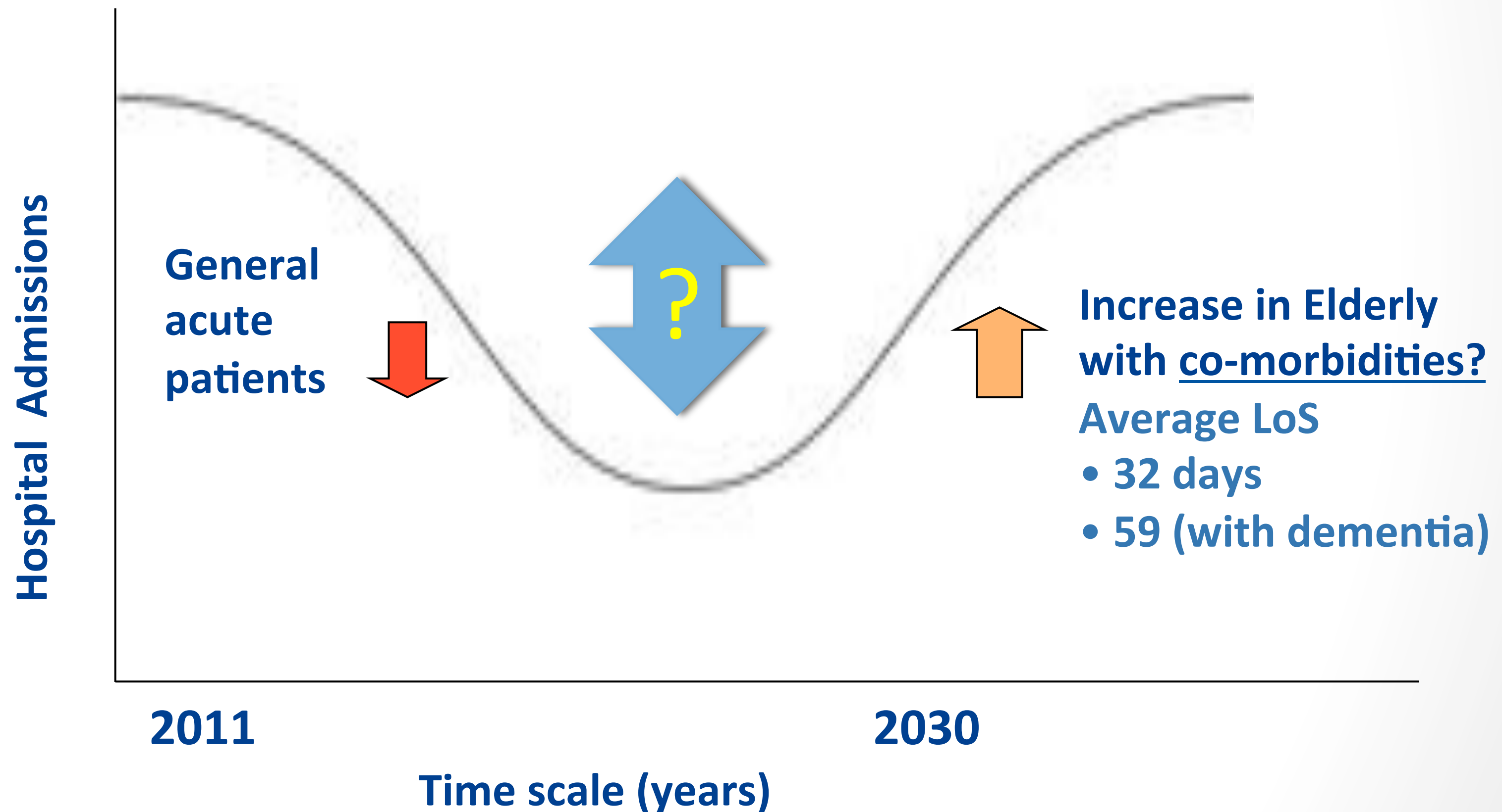
Strategic planning - hospital inpatient demand Have we worked out the trend / future investment pattern?



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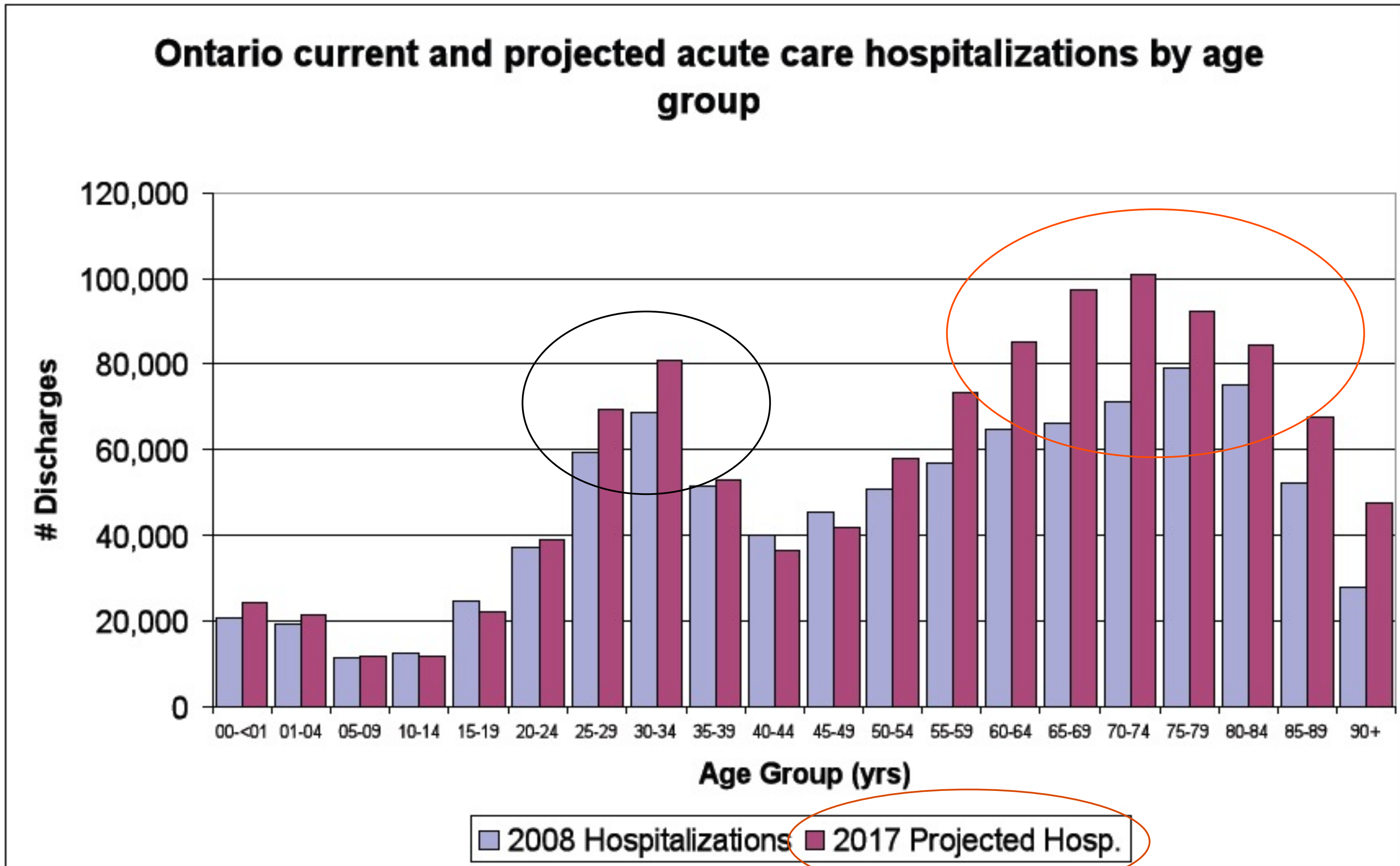
Ontario Canada – is this projection right – and affordable?



or - Adaptability – elasticity, functionality, intrinsic value - and diversity

hotel
hot floor
office
industry

Layers model
TNO Netherlands

OFFICE
HOT FLOOR
INDUSTRY
HOTEL
M medical relation
O organizational relation

An Integrated Services Model

Local Hosp.
Acute Hospital
Local Hosp.
150-300 Thousand
Acute Hospital
CHC
Local Hosp.
Non-health agencies
1.7 Million
Regional Hospital
100 Thousand+
CHC
CHC
HC
20 – 70 Thousand
Acute Hospital
Individual homes
HC
2-10 Thousand
Other Community Facilities.

Comm Fac.
Leisure/Fitness Centre
1 HC
2 CTCC
Rec/ Café/ Atrium
Day Centre
Pharm.
Library/ Resource Centre

Integrated care NI

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Changing the model of healthcare

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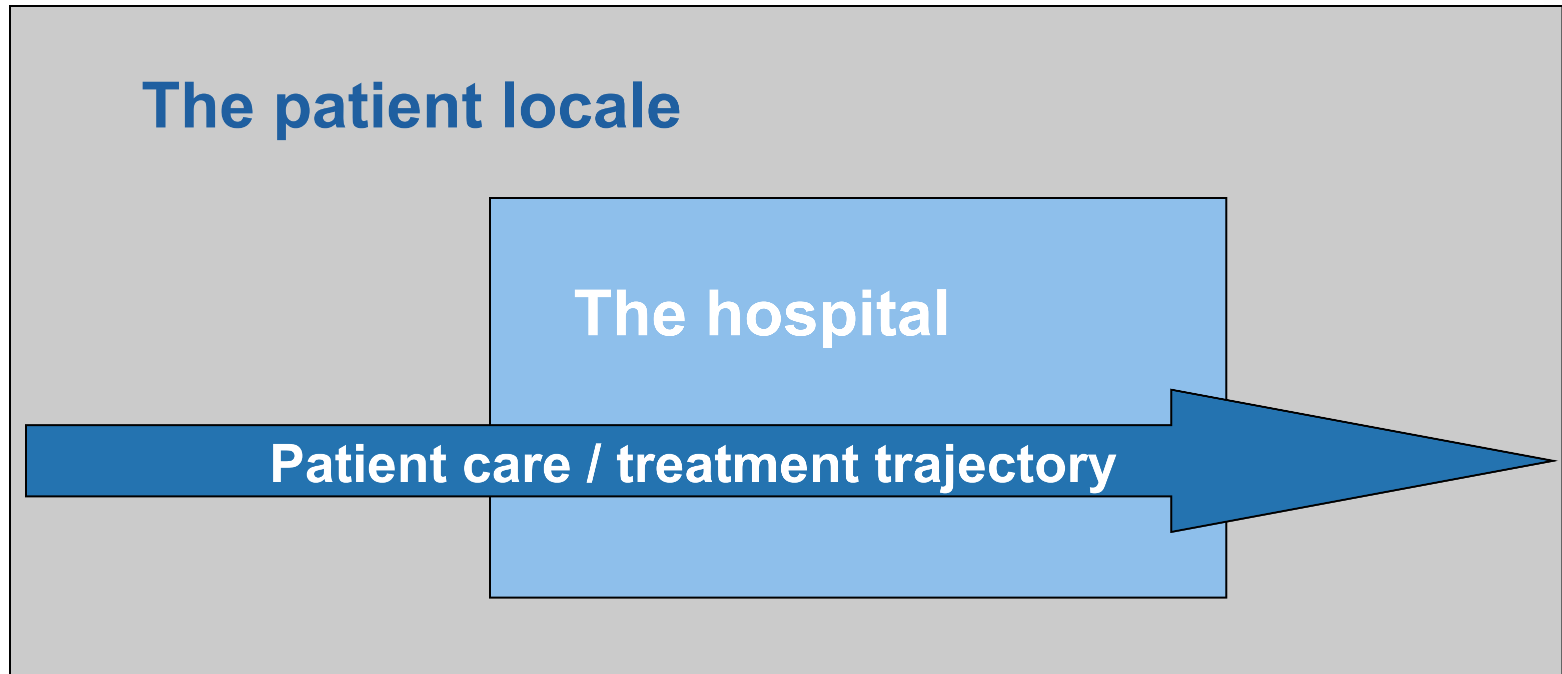
Divergence over models for change
A growing consensus about the benefits of integration
The care pathway model

Top down structural reform	Market driven reform
• An integrated population based healthcare masterplan • Integrated implementation policy • Service and capital resource realignment strategies • Top down direction of financing priorities and 'allocation' of resources • Public engagement strategies	• Declaration of central policy aims - for commissioners / or • Establishment of 'arms length' commissioning influenced by local needs • Patient choice led competition • Liberalisation of hospitals, greater / complete autonomy • Ease of entry for new providers

A paradox at the heart of European healthcare reform

Pathways - are a simple concept, the project management of (whole) disease

- internalised (within hospital) or
- externalised (integrated across sectors)



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Care (clinical) pathways as a basis for planning and investment

- **A predictive description of clinical / care systems**
- **Measurable inputs and outcomes**
- **A means of translating changing demographic and epidemiological health needs into a service language that is essential for service and capital asset planning**
- **A means of clinician participation in planning**
- **A means of economic planning and control**

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Transformational impact in the hospital sector

- From: Patients use the system in a series of unconnected episodes
- **To: Health systems develop methods to manage the whole pathway of disease**

- From: Patients are dealt with in batches and spend most of their time in the system waiting
- **Patients flow through the system with minimal waits. Sweating the assets is less important than achieving a smooth flow through the system**

- From: Services are designed around the historic way providers are structured – somatic and territorial separation
- **To: Multi-disciplinary team problem solving – the hospital as a knowledge centre - and home-based technology and diagnostic equipment outside the hospital to reduce the use of hospitals**

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Clinical Quality – a main driver of future reconfiguration – minimum volume thresholds

	Areas of care	Volume thresholds	Example references
Trauma	▪ Severe head injury ▪ Moderate and major trauma (ISS >9) ▪ Penetrating abdominal injury ▪ Multi-system blunt trauma	▪ Level 1 trauma center per 3 million population ▪ All trauma volume >1,200/yr ▪ ISS>15 case volume of 240 unit/yr and 35 surgeon/yr	▪ RCS/BOA, Better care for the severely injured, 2000 ▪ Health Service Research, 2005;40(2):435-57 ▪ J Trauma, 1999 Apr;46(4):565-79. ▪ J Trauma, Jun 2006, vol. 60, no.6, 1250-6 ▪ Lancet, 2006, 366;9496;1538-1544 ▪ JAMA, 2001;285:1164-1171 ▪ NEJM, 2006, Jan 26;354(4); 366-78
Stroke	▪ Rapid access to acute specialist center ▪ Ongoing multi-disciplinary care in a specialist stroke unit	▪ Comprehensive stroke center per 2-3 million population ▪ Regional stroke centers per 300-700,000 population	▪ BMJ, 2004;328;369 ▪ Royal College of Physicians, Audit 2001 ▪ DH NSF for Older People ▪ Cochrane Review, 2001, issue 3 ▪ Stroke, 1999;30;930933 and 1999;30;1524-27 ▪ Cerebrovasc Dis, 2006; 23(2-3), 194-202
Heart attack	▪ Rapid access to specialist high-volume PPCI units with high-volume PPCI physicians	▪ Volume thresholds (American College of Cardiology et al): – ≥75 PCI per physician per year – Units performing ≥36 primary PCI and >300 PCI per year	▪ Lancet, 2003;361;13-20 (meta-analysis 23 trials) ▪ Circulation, 2006;113;222-229 & 2001;104;2171-6 ▪ JAMA, 2006;296;1749-1756 ▪ NEJM, 2003;349;733-42 ▪ Eur Heart J, 2003;24;94-104 ▪ J Am Coll Cardiol. 2001 Jun 15;37(8):2170-214
Specialist surgery	▪ Cardiothoracic surgery ▪ Vascular surgery ▪ Surgical oncology ▪ Hepatobiliary/pancreatic surgery	▪ Specialist emergency surgery center per 350-450,000 population ▪ Strong evidence of positive relationship between surgeon volume and specialization and patient outcome	▪ RCSEng, Delivering high quality surgical services for the future, 2006 ▪ B J Surgery, 2007; 94; 145-161 (meta-analysis of 163 trials)
Obstetrics	▪ Normal delivery ▪ High-risk delivery	▪ Normal deliveries, units with >1-3,000 births/year (outcomes improving with increased scale); rising to >4,000 for economic scale ▪ High-risk deliveries, >50 high-risk deliveries/year plus >5,500 normal deliveries/year	▪ Am J Obstet Gynecol, 1998; 179:374-381 ▪ Obstet Gynecol, 2001; 98:247-252 ▪ Geburtshilfe Neonatol, 2004; Dec; 208(6):220-5 ▪ JAMA, 1996;278:1054-9 ▪ RCOG, *The future role of the consultant*, 2005 ▪ Arch Dis Child Fetal Neonatal Ed, 1999;80:F221-F225
Pediatrics	▪ Planned: cardiac, specialist and transplant surgery, and oncology ▪ Acute: trauma, PICU, and general surgery	▪ 1 specialist pediatric center per 5mn population ▪ For less specialist services, provision only by specialist pediatric teams	▪ HSE Ireland, Children's Health First, 2006 (citing >60 studies) ▪ British Assoc of Paediatric Surgeons Guidance ▪ Pediatrics, 2000;106;289-294 ▪ Pediatrics, 2004;113;18-23 ▪ Neurosurgery, 2000;47;879-885

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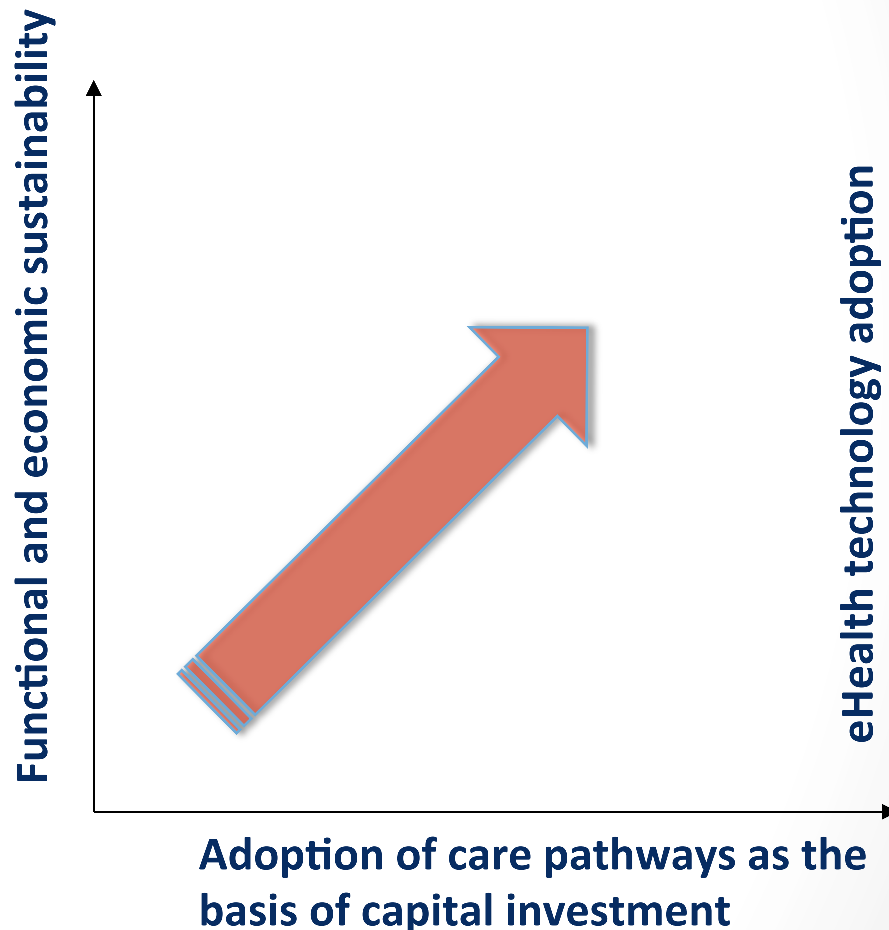
The benefits of pathway influenced investment

Work Process based systematisation

- open, transparent and accountable clinical governance
- supported by new technologies – eHealth

Care Pathway based investment planning

- improved translation of service need into investment solutions



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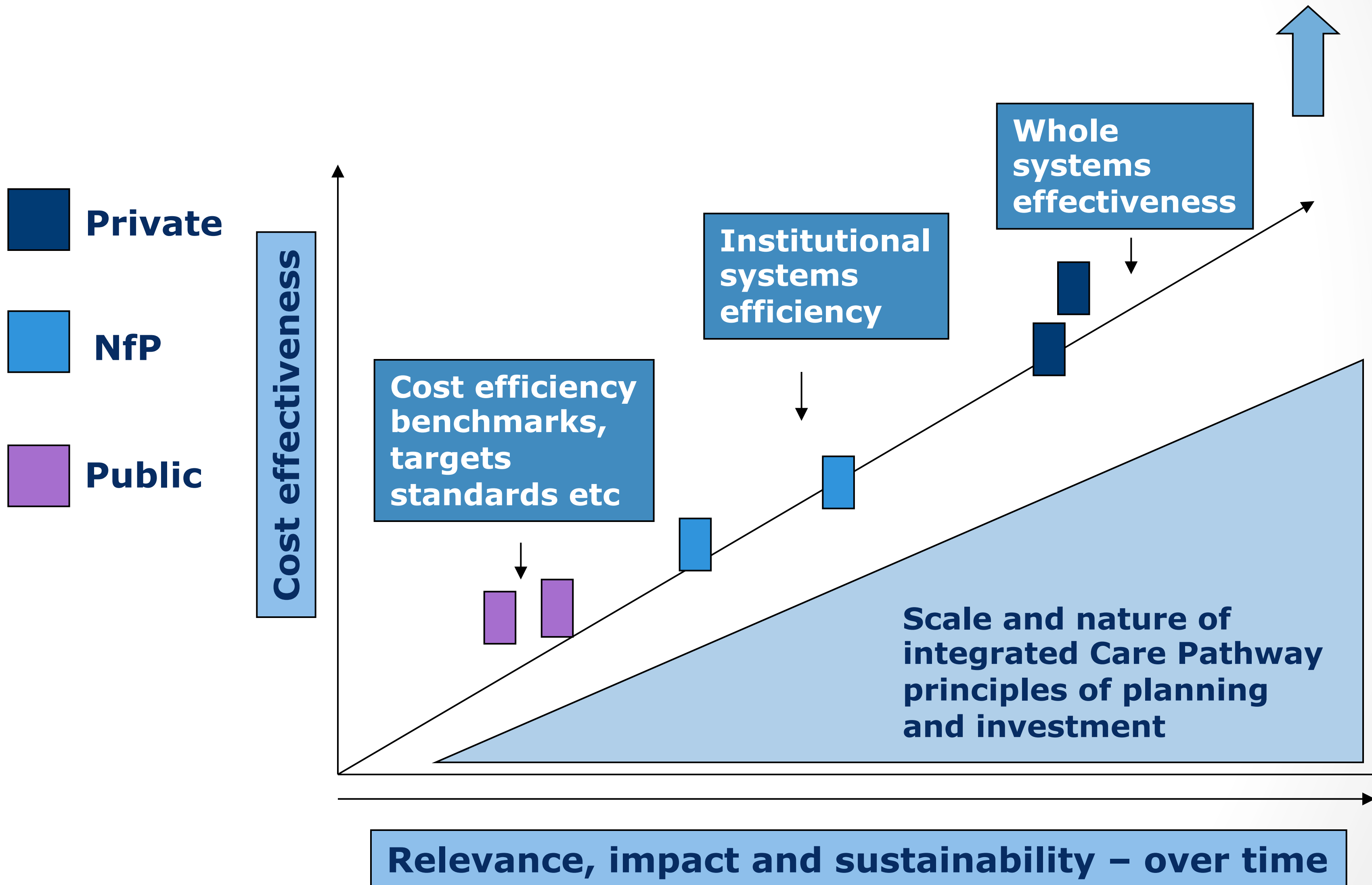
The impact of care pathway principles on business structuring and performance



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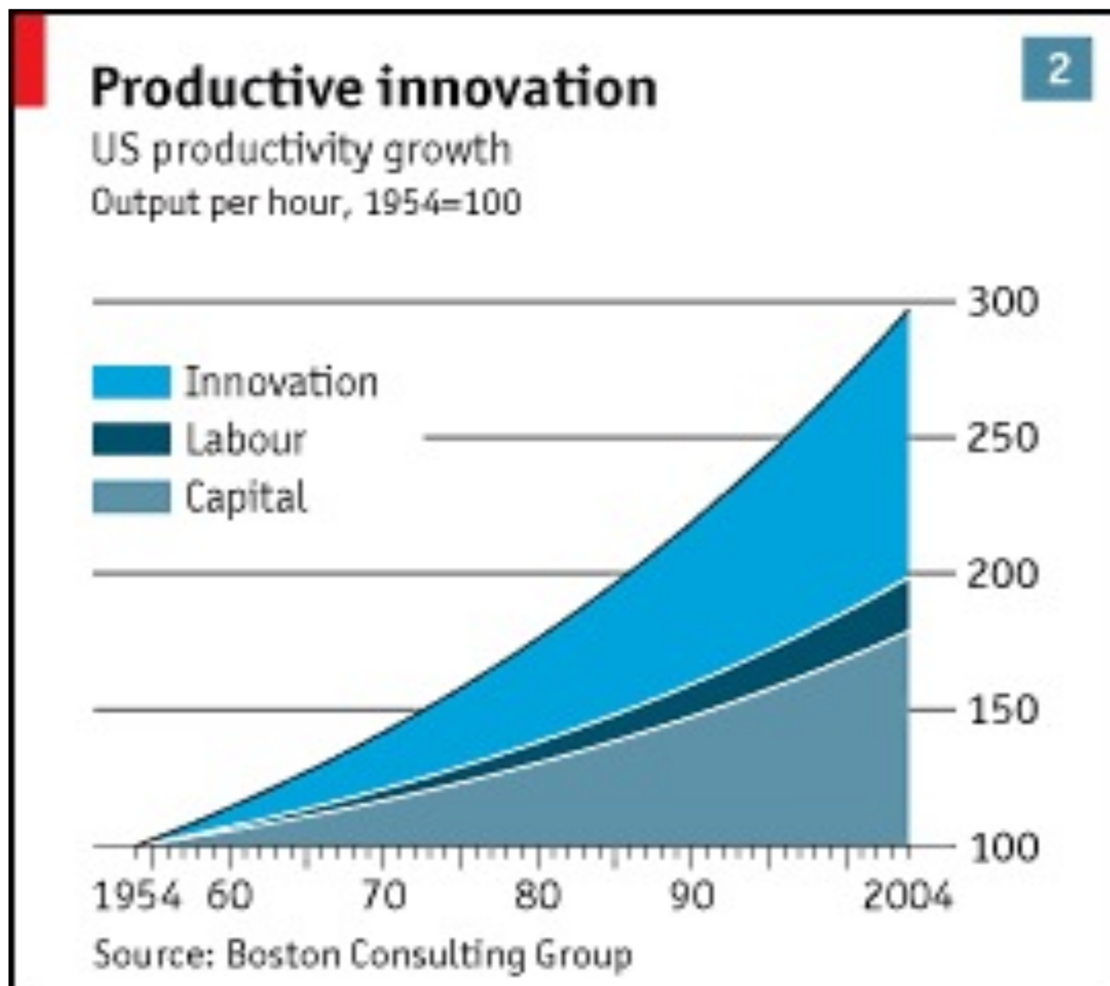
Innovation is a key factor
Productivity growth, Output per hour,

2004 - 300

1954 = 100



Innovation

Capital

Source: Boston Consulting Group, The Economist, A special Report on Innovation, October 13th 2007, pg 4.

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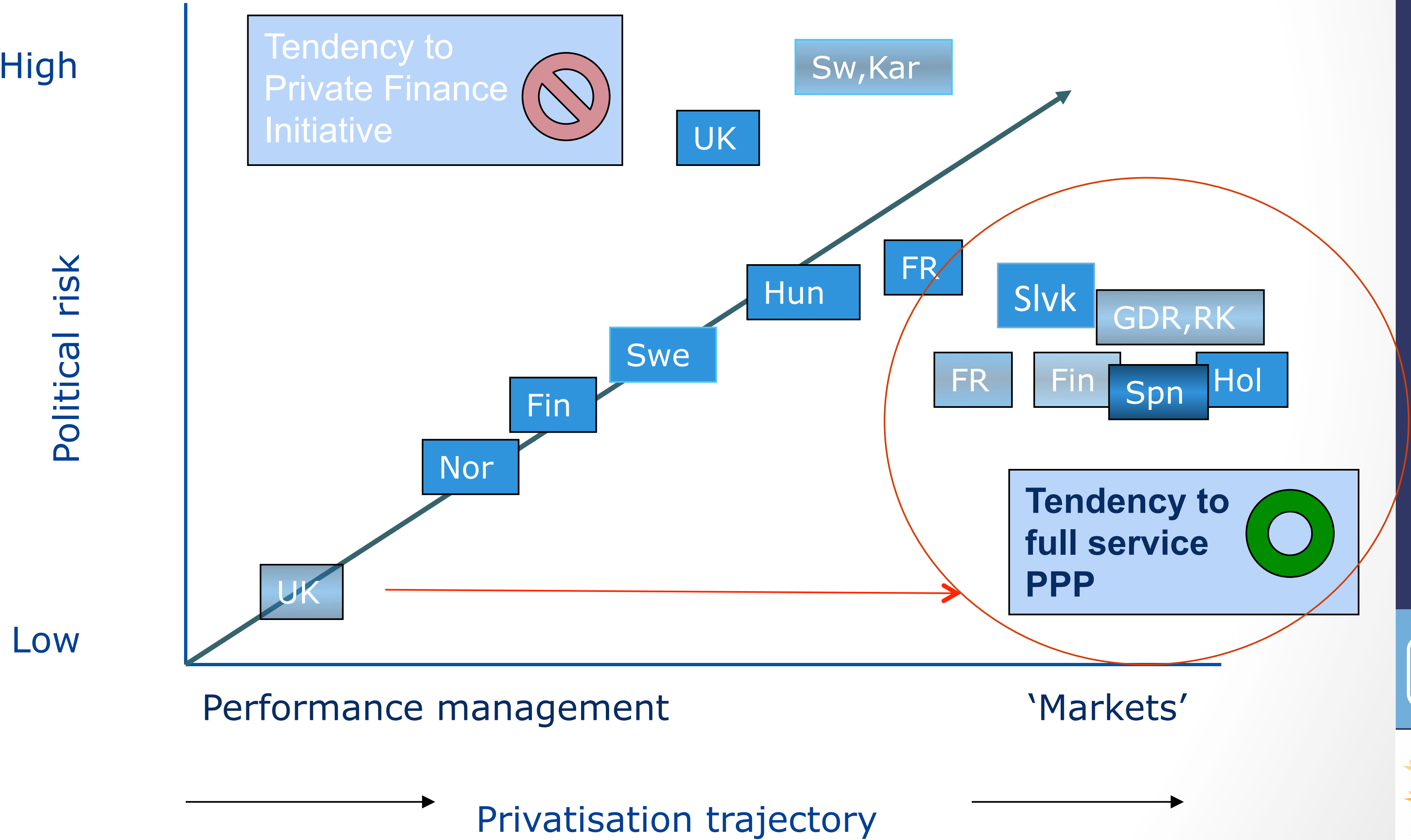
Capital - the trend towards (PPP) market models will almost certainly accelerate



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The EU

&

The Hungarian Presidency

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‘Europe 2020’ – a redefining document

- Regaining economic growth and sustainability
- Regenerating the European economy
- Technology as a driver of global competitiveness – and
  - Public sector efficiency and effectiveness
- Job creation
- Social cohesion
- The carbon agenda
- Health – implicit not explicit
  - Overcoming health inequalities
  - eHealth as a transformational change technology
  - Cross border care
  - Structural aid – but a change in application
  - Affordable and sustainable health systems
- PPP as a stimulant to improve public sector delivery and competitiveness

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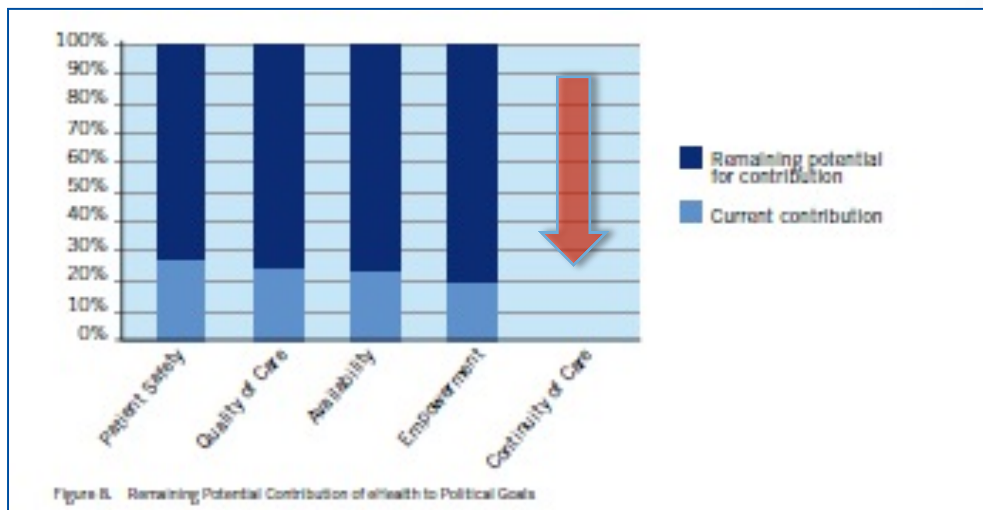
eHealth: - Quality, Clinical costs, Administrative costs, New models of care.

- **9 million bed days – savings from computer based patient records = € 3.7 billion – but**
- **Lack of significant penetration in changing the way we work?**
- **Is eHealth too technically focused ?**

Professional resistance
Public mistrust and apathy
Poor absorption capacity
Wrong focus

- **From technical**
- **To operational and strategic**

Weak evaluation



eHealth for a Healthier Europe, Gartner, Sweden 2009

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Hungarian Presidency
"Investing in Health Systems of the future"
"Patient and Professional Pathways"

Context

- Investing in health systems in difficult economic times

Themes

- An EU wide 'common reflection' process on health systems, structures and priorities
- Monitoring and measuring the effectiveness of EU Structural Funds – and working together to introduce more innovative and integrated application
- Shift healthcare from the dominance of cost containment to investment in economic growth
- Coping with healthcare manpower mobility and volatility

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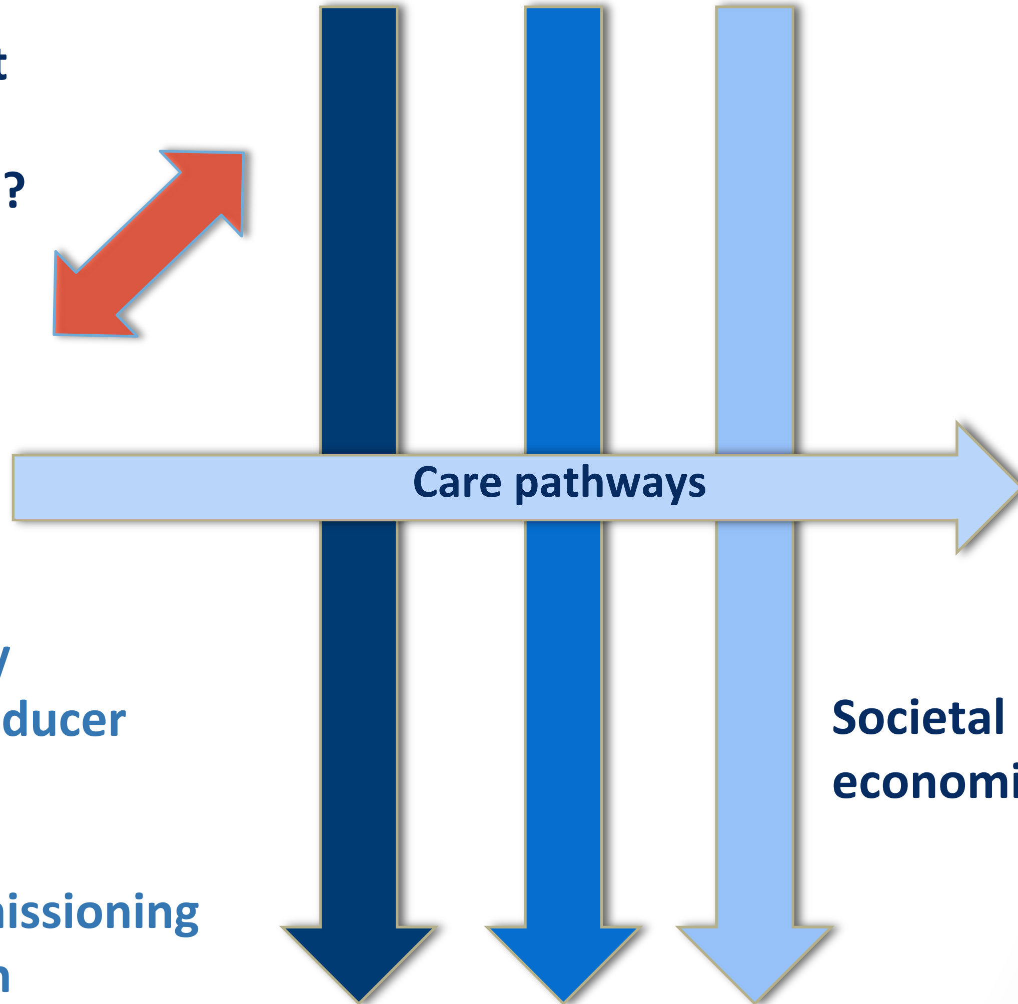
Hungarian Presidency
Pathways for change

Changing focus
What works and what Doesn't in the 'new' healthcare landscape ?



Whole systems disease management

- Coherence
- Population sensitivity
- The patient as co-producer

- More effective commissioning
- Resource reallocation
- Workforce realignment

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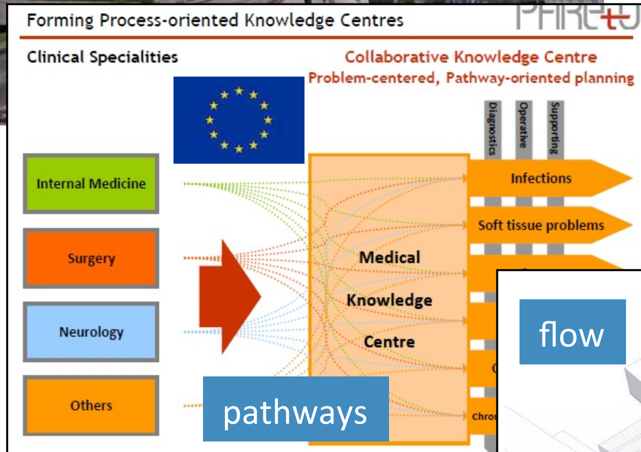
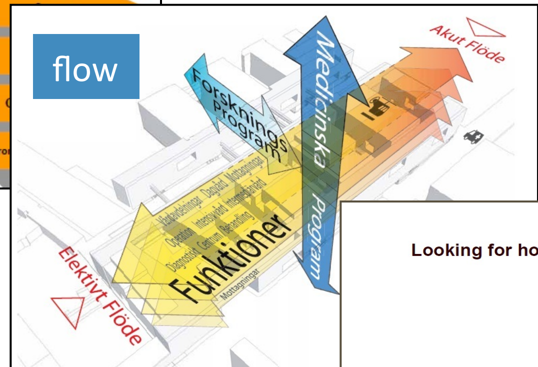
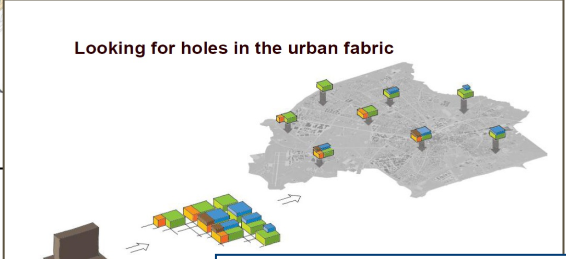
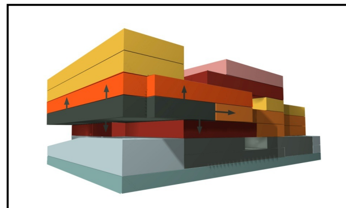
Pathways as a route to transformational change From hospital centricity to patient centricity



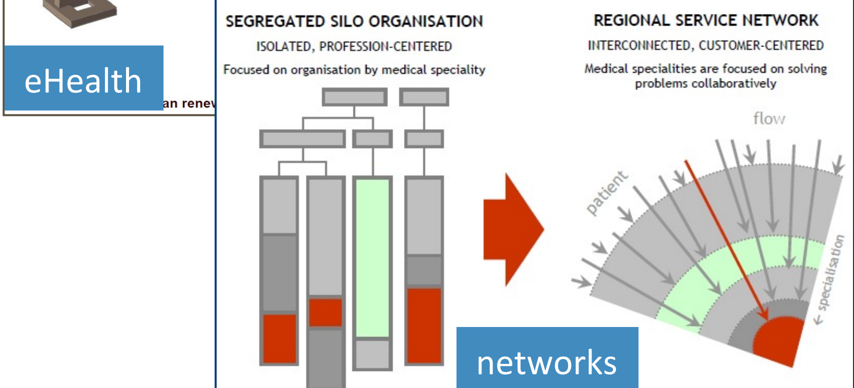


Local accessibility / diversity





The modular adaptable 'hospital'



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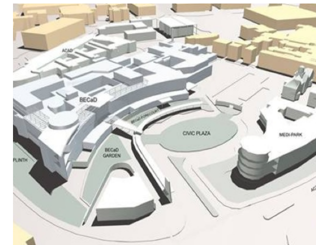
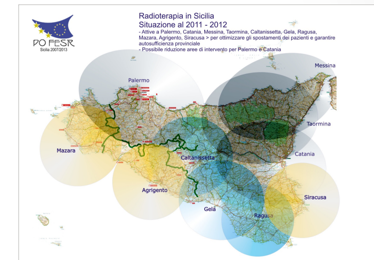
The coming decade:

- Sustained and severe public service austerity
- Integrated whole systems (disease based) planning and investment
- Government as insurer (of last resort)
- Devolved and more outsourced service delivery – diversity and competition
- Investing in human capital, social cohesion and economic sustainability





- Healthcare integrated in the city and networked to rural societies
- Mergers and consolidation of general acute hospitals

- More specialist and local & accessible 'niche' services
- Growth in primary care investment

- Fewer but larger tertiary (knowledge) centres

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It will not be easy

Thank you for your attention

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