The New Health Economy – A Global Perspective

Globalization, Health and Innovation

Health and Wellness in a World Without Borders

Learning from WHEREVER we can find the best or better way of doing things. *Open minds and Open Innovation*.

Professor Alan Barrell – Judge Business School Cambridge and Chairman NHS Innovation Council East of England – Visiting Professor of Enterprise – Xiamen University Fujian China

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My life in Healthcare - Wearing Company and Investor Hats and always engaged with the ***NHS***

Baxter

PneumaCare

eagle genomics

MedTech International and China

how are you?™

PROBE SCIENTIFIC

BACTEST

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Healthcare in a World Without Borders and Barriers

Agenda

- Context – A changing and uncertain World
- The Global factors that affect EVERYTHING
- My World Without Borders
- The Age of Science and Technology
- The potential in Open Innovation in Healthcare
- Human Capabilities and Failings – Creativity, Imagination, Greed and Fear
- Innovation – Adoption and Diffusion of new ideas

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Healthcare in a World Without Borders and Barriers

Global Factors – macro

- Population growth and Human aspirations
- Globalisation and Urbanisation
- Seismic shifts in the World Economy – but still much poverty
- Climate Change
- Uncertainty and Turmoil – Crisis or Opportunity ?
- The Scientific Century and the Age of Technology
- Human Creativity , Open Innovation and Entrepreneurship
- Politics and Finances – Public/Private and Industry
- Human behaviour and emotions – Greed and Fear
- Importance of Industrial Contribution

Potential of "*World Without Borders*" mindset – Why not – "*Healthcare Global*" ?

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Health Policy is not just Health Policy…. discuss

✓Foreign Policy can have a health dimension

✓Promoting Global Security – fear of global pandemics - spread of pathogens

✓Promoting Economic Development – "Health is Wealth" Opening new markets for products and services

✓Promoting Social Justice – Health as a Social value

✓The Healthcare Industry demands promotion and can save lives and be a power for the good

✓Collaborative cross border medical research enhances cross border and cross cultural progress

A World Without Borders and Health and Wellness crossing borders is more than a dream….

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Meet Rufus
His first day of life beyond mother

My Family *before* Rufus….

Rufus in this picture is inside the lady with the green top

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The Worlds great and growing family *wants to be Healthy!*
Education Without Borders
Healthcare without and beyond Borders
Creating a World Without Borders

Our World – Our Context– does my Eye on The World see much CHANGE taking place ?

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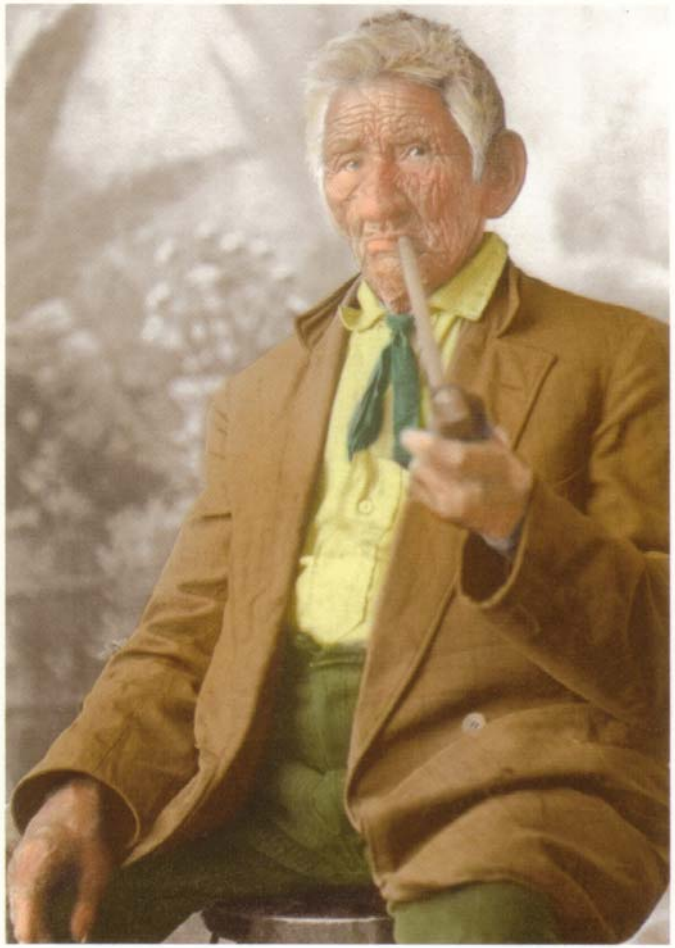
There are CHALLENGES….

If I had known I was going to live this long
I would have taken better care of myself



Population growth and ageing….seismic changes in World Economic Power and Influence. An era of uncertainty

Growing healthcare needs – and reducing budgets. 7 billion world citizens now. 50% live in cities. 98% of future pop. growth in emerging economies

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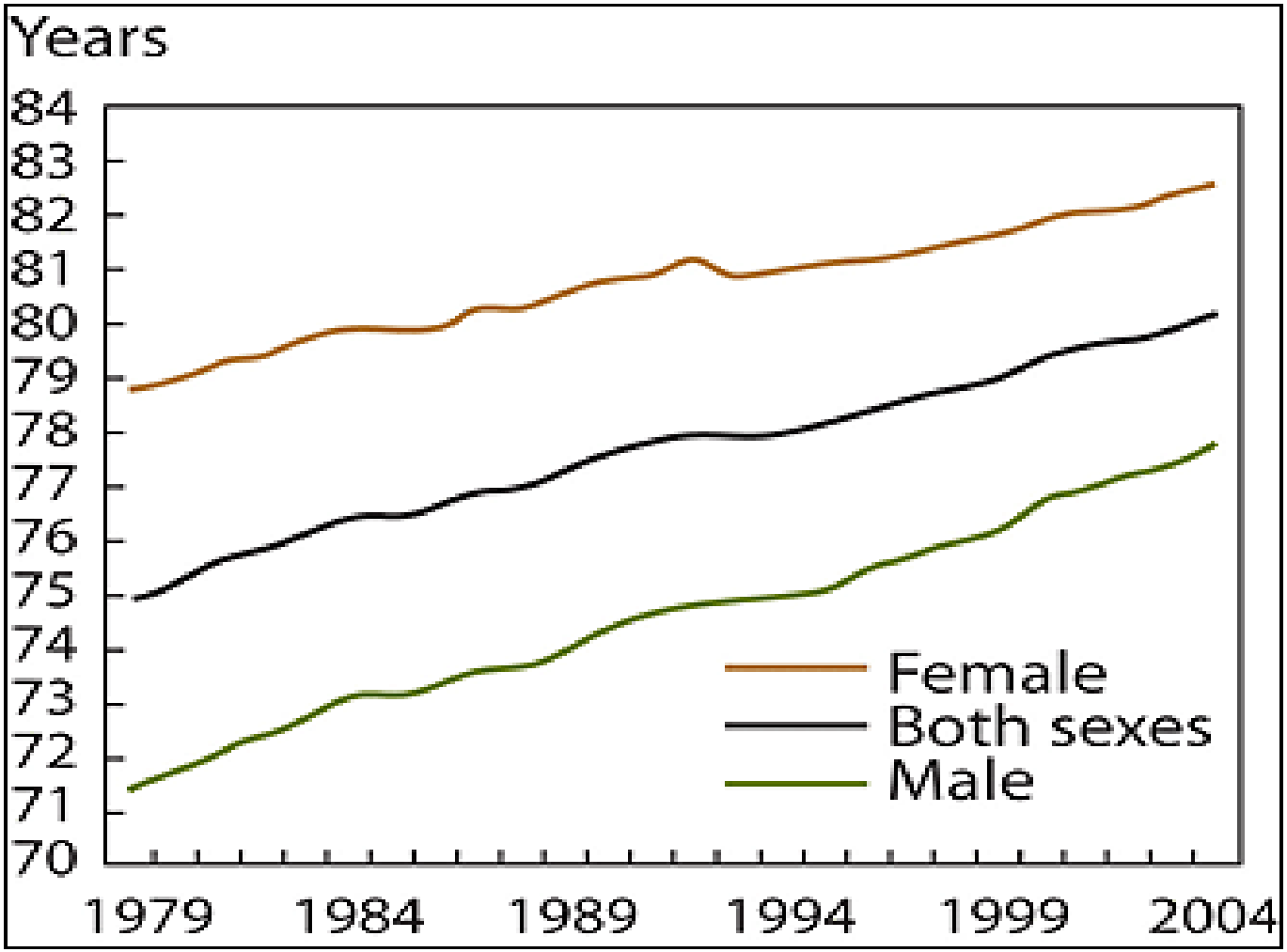
Focussing on the UK - Living longer - year by year – similar trends in the West generally – and progressively elsewhere



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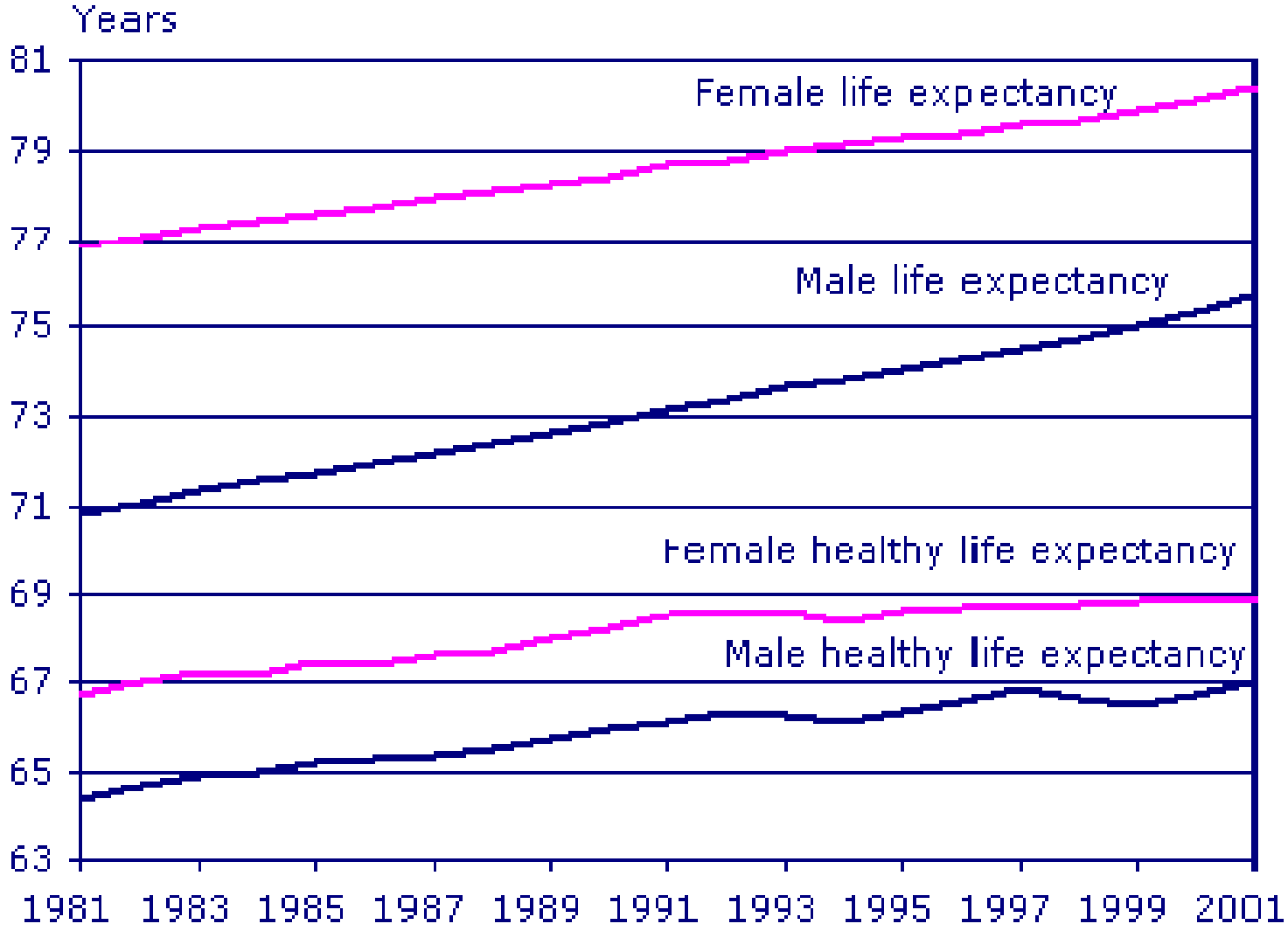
But not always living *"healthier"*



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Centenarians - UK

- 300 in 1952
- 2,600 in 1981
- 11,600 in 2009
- 228,000 in 2015
- 500,000 in 2020
- ? Headed for 1Mill?
- 3million of babies born 2010 will live to be 100
- Long Term HC ++++

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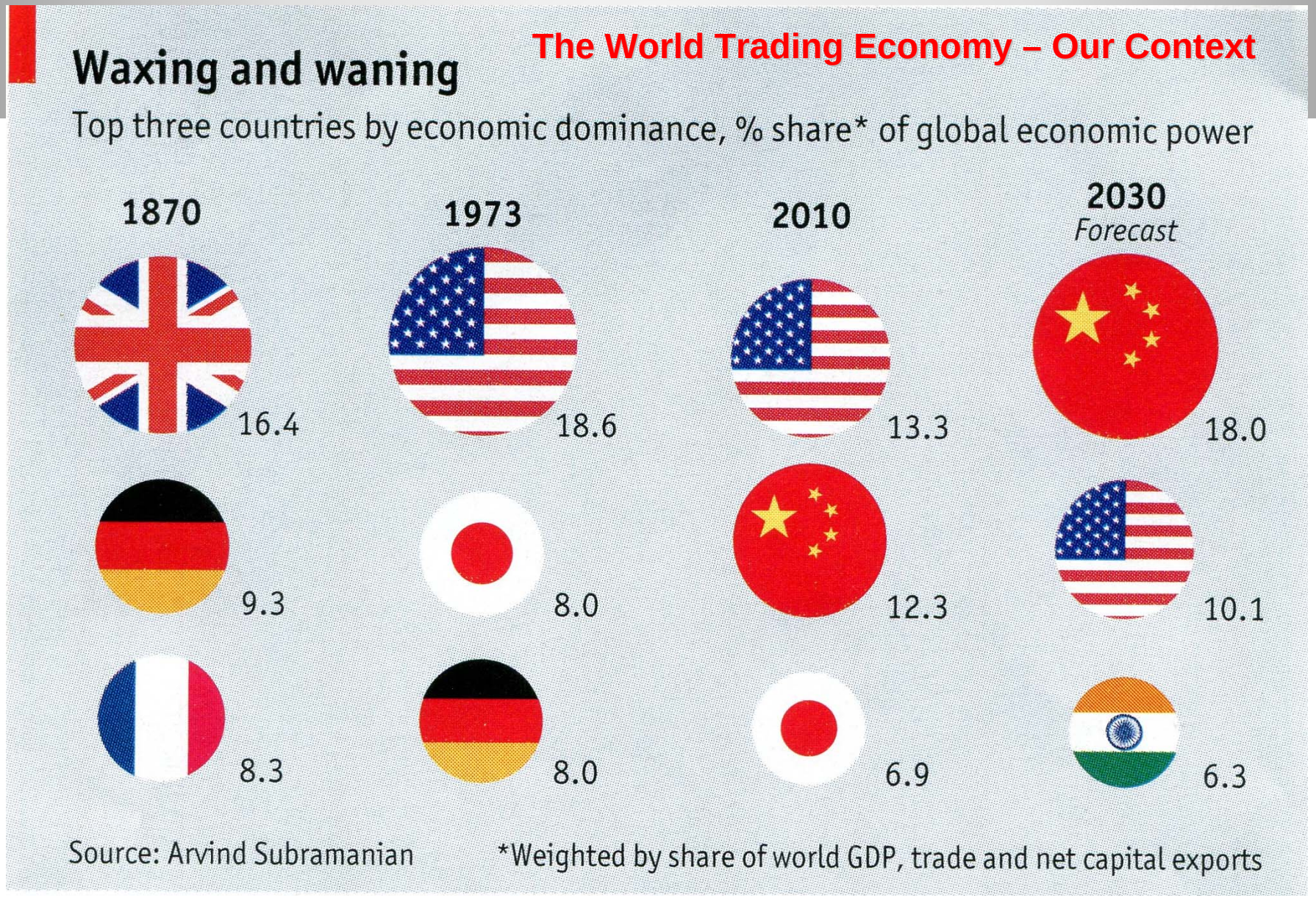
The World Trading Economy – Our Context



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Seismic Shifts in power from West to East –North to South – implications for world Culture as well as Economics

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Poor old Europe – more than a bit deflated !
Is there worst to come ? It is *serious*

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There are still Winners and Losers in our World

Entrepreneurship* Can it be *the difference ? It CAN drive Social Change- examples Grameenphone and Frontline SMS. Healthcare could be a driver

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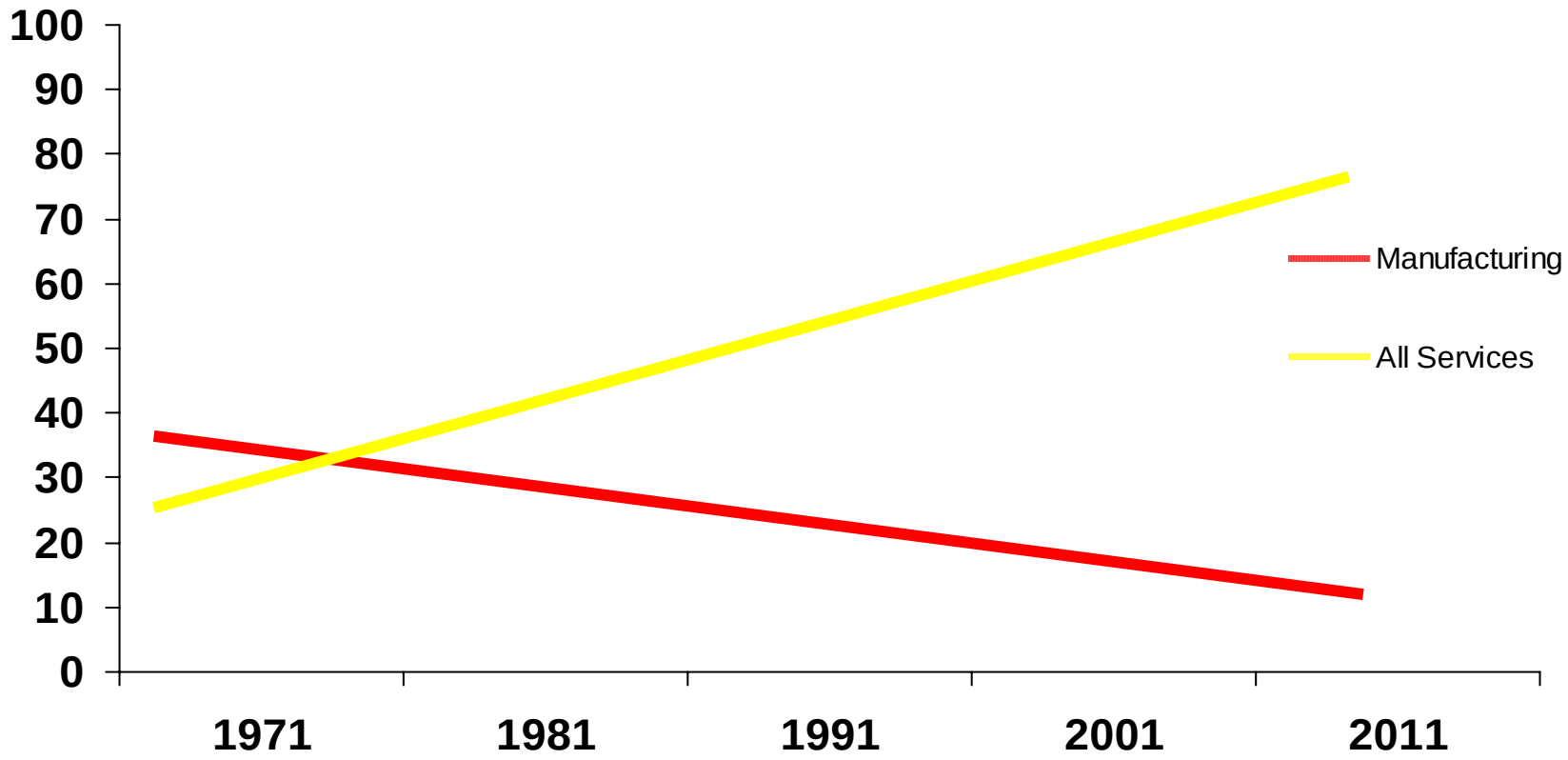
Changes in Industrial Structure - UK

% of Total Employment - UK Government Foresight Report 2001



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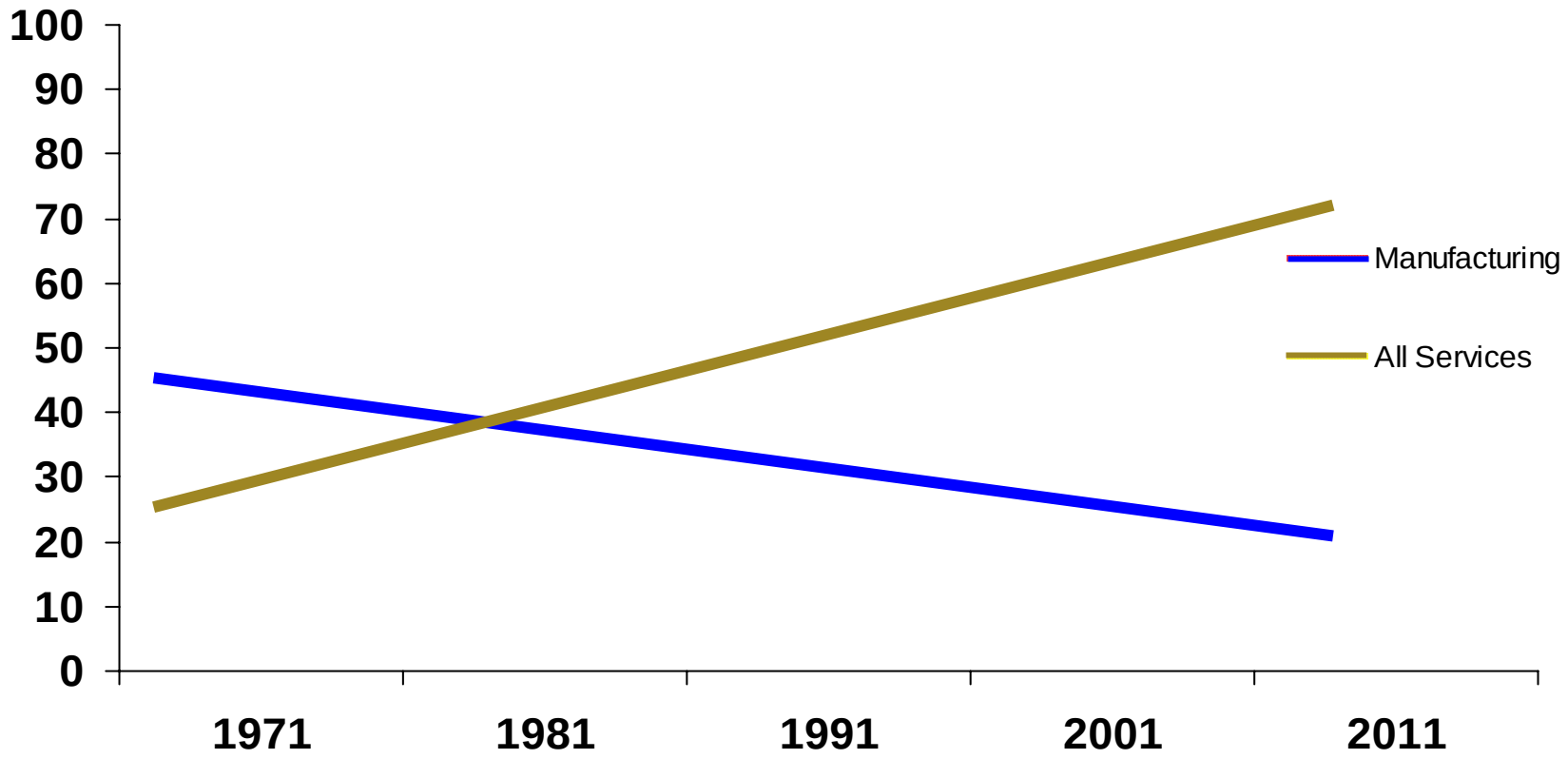
Changes in Industrial Structure - Europe

% of Total Employment



Manufacturing has *Migrated !*

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The West's Competition ??

So in the West have we CRISIS????

or

OPPORTUNITY!!!!!

危机

***MINDSET* can make *THE DIFFERENCE* – between GOOD TIMES AND BAD TIMES**

And that goes for Healthcare as well as generally – more later….

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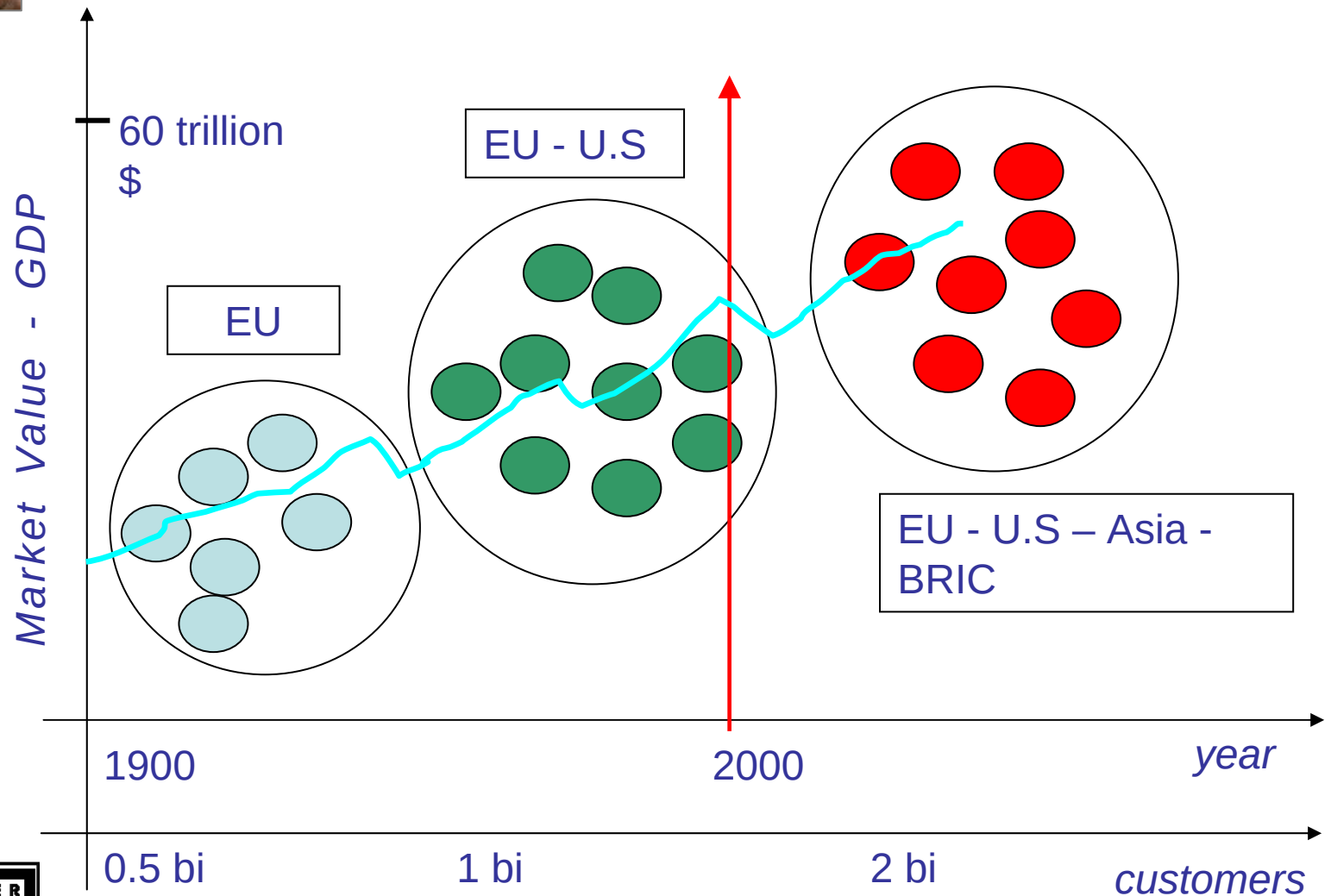
The World became Flat ....

Thomas Friedman

Moving to be a *World Without Borders - Learning from many sources – seeking best practices*



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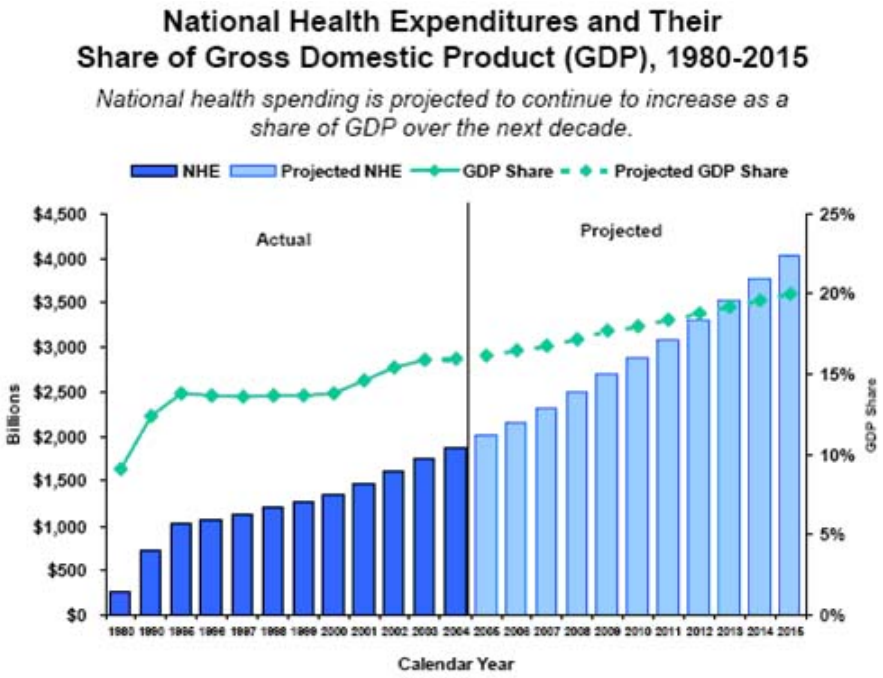
The quest for Good Health and Wellness is Universal

Healthcare Costs

Healthcare expenditure



Source: CMS, Office of the Actuary, National Health Statistics Group.

- Escalating
- Global
- BRIC nations ++

- Still disparities:
  USA – 15%
  Philippines 2.9%

- Priorities and challenges differ…
- Striking examples

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Contrasts and Divisions – The great divide …1

Estonia	**Million inhabitants**
	1,34
	Area
	45 227 km²

- 100% Health Cover
- Integrated Care
- Citizens Health Information System
- Low infant mortality and long life expectation

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Contrasts and Divisions 2

India	Billion inhabitants
	1.3
	Area
	2,973,190 km²

- Low level of Health insurance / cover
- Little organised care
- No integrated information systems
- Infant mortality rate high – 1.72m children die annually – before 1 year. Malaria, HIV etc. still priorities
- Priorities are malnutrition, immunization, infrastructure BASICS

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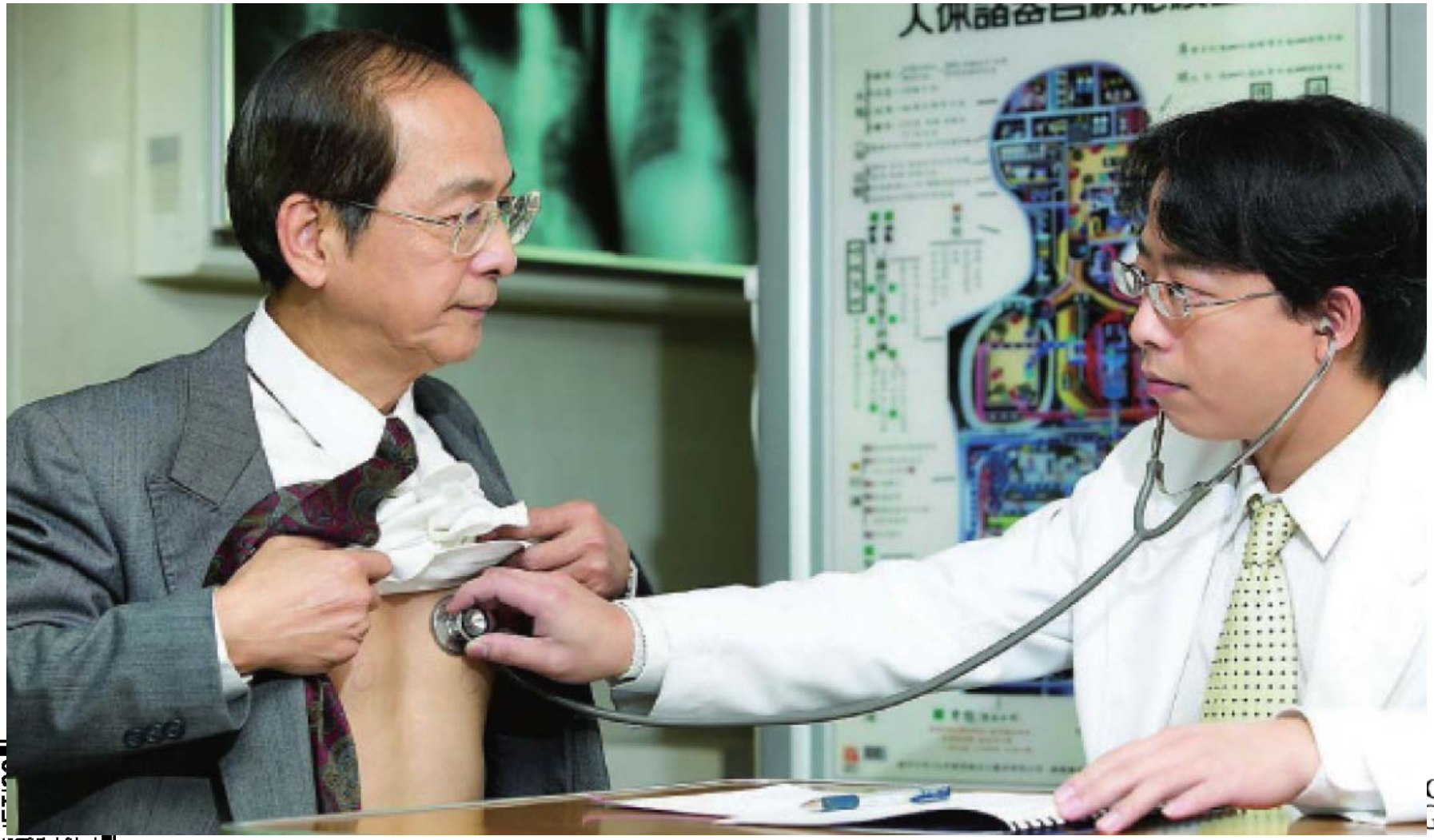
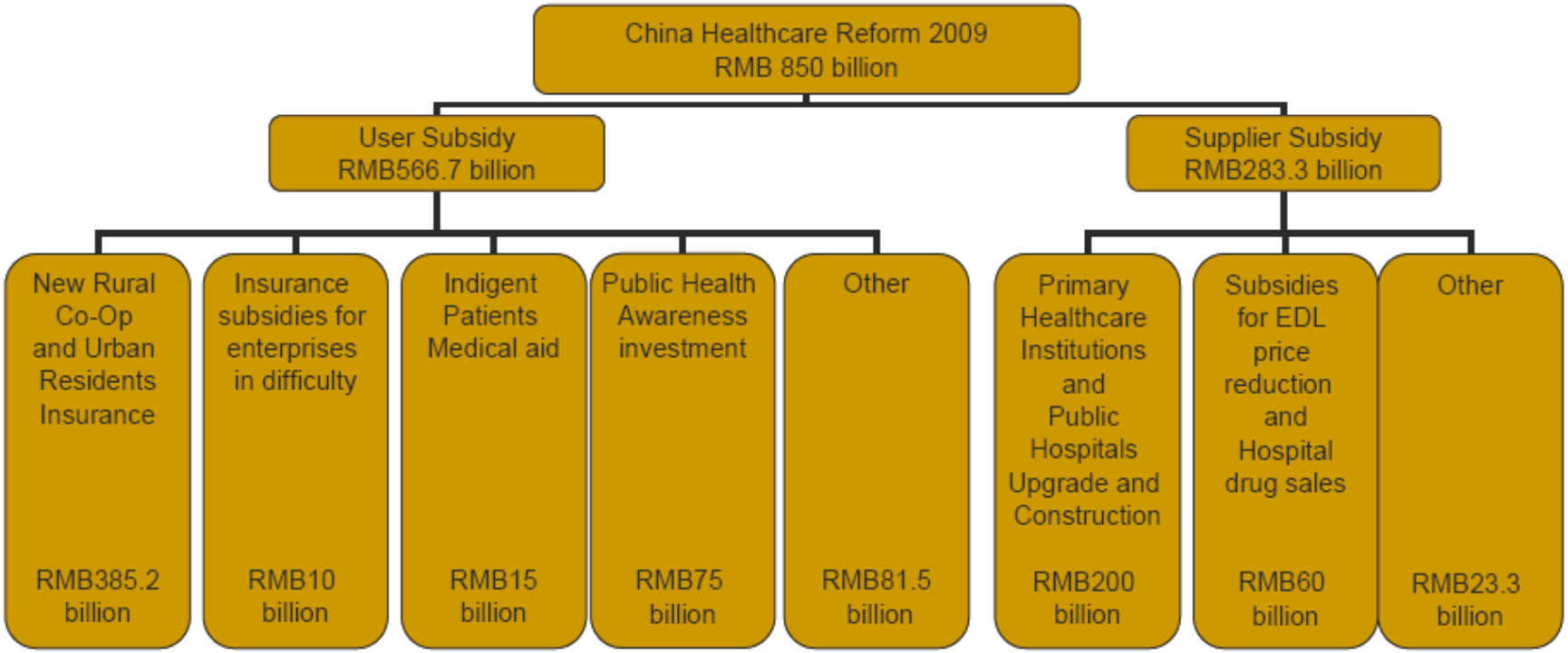
China – Health Reforms and Progress in a nation of 1.35 billion citizens



China's Health Reforms – a massive programme – we are not alone….

Figure 1: Breakdown of China's 2009 Healthcare package



Source: Implementation Plan for the Recent Priorities of the Healthcare System Reform (2009-2011)-Shanghai Pharma Prospectus

2,000 new hospitals; 2,400 urban community clinics;5,000 township clinics; medical insurance coverage for 90% of people by end 2011;"regularise prescribing"

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Looking at our UK Health Service as an example to raise general issues - The White Paper "Liberating the NHS"

- "An NHS which achieves results that are amongst the best in the world"
- A service judged more on outcomes
- Greater choice and plurality
- A stronger voice for patients and the public
- Greater involvement of clinicians
- Cutting bureaucracy

So where are the challenges?....

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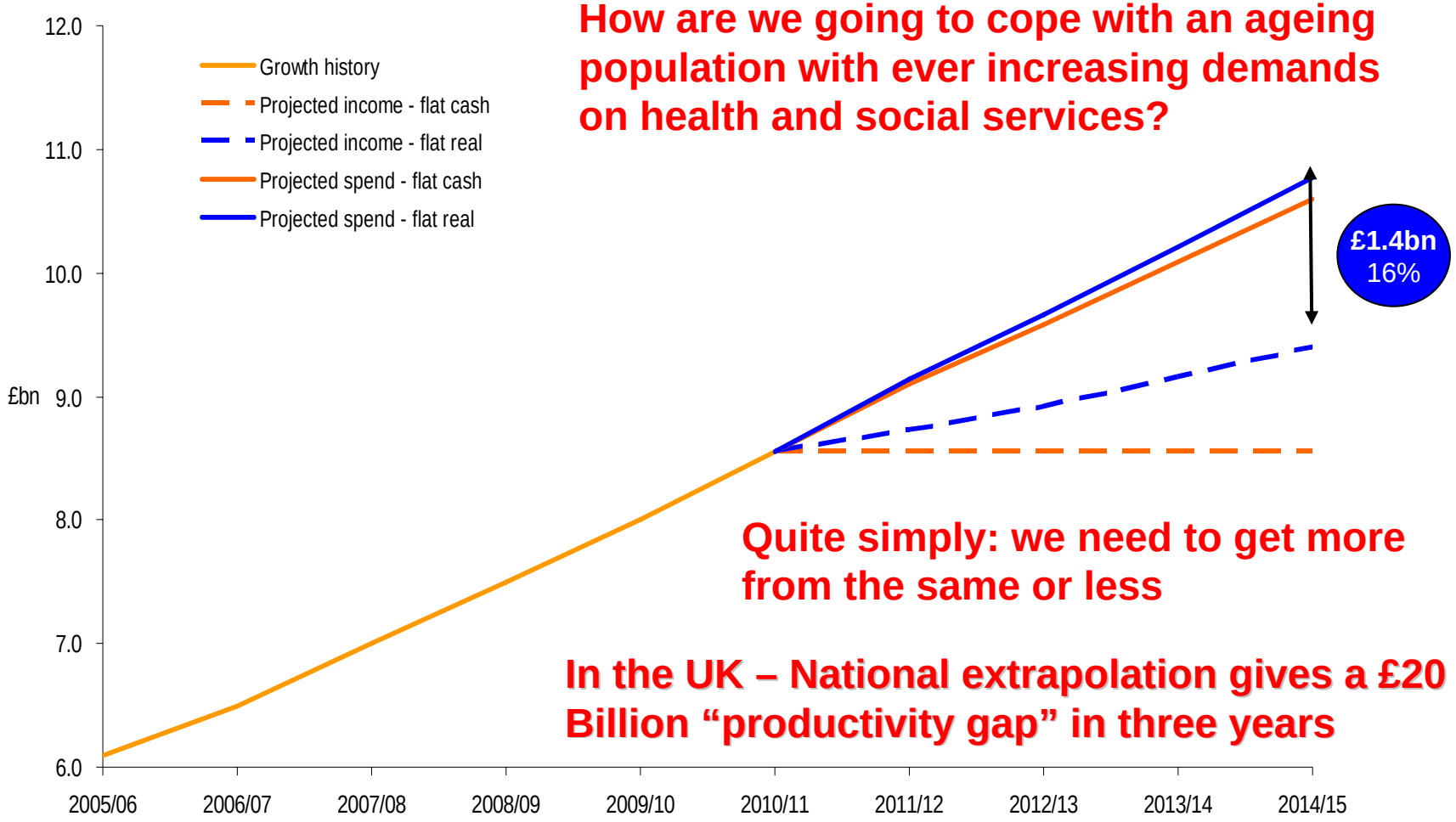
Demand is outpacing available funds – A serious productivity gap….Regional example



How are we going to cope with an ageing population with ever increasing demands on health and social services?

Quite simply: we need to get more from the same or less

In the UK – National extrapolation gives a £20 Billion "productivity gap" in three years

National HC Budget £110 billions – 70% on Long Term Conditions

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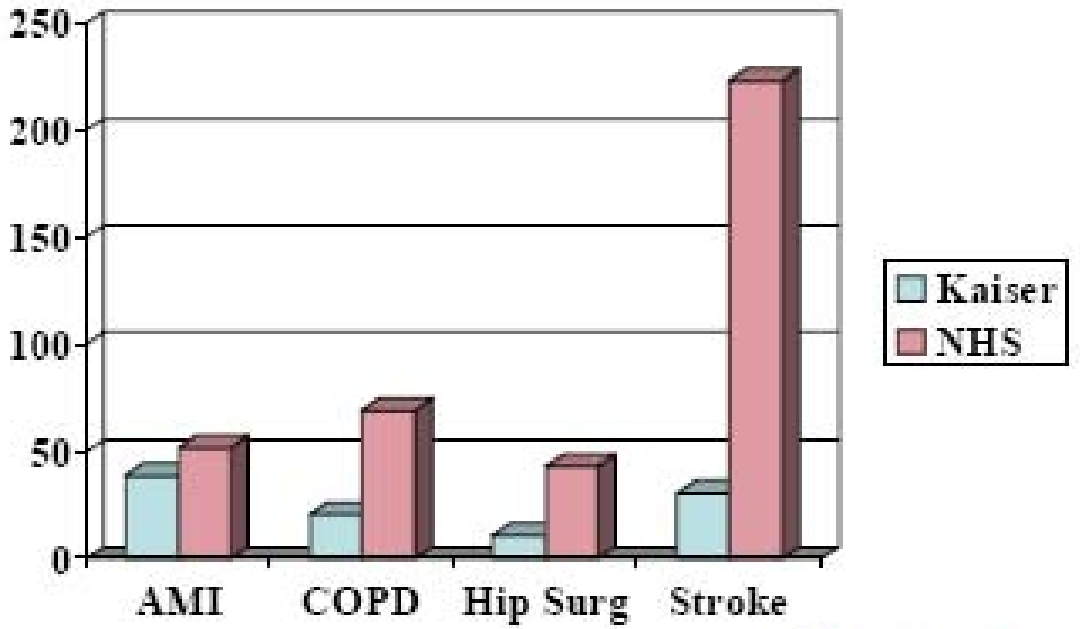
A disturbing comparison Kaiser model and the UK NHS

Hospital Utilization: Days/1000



KAISER PERMANENTE

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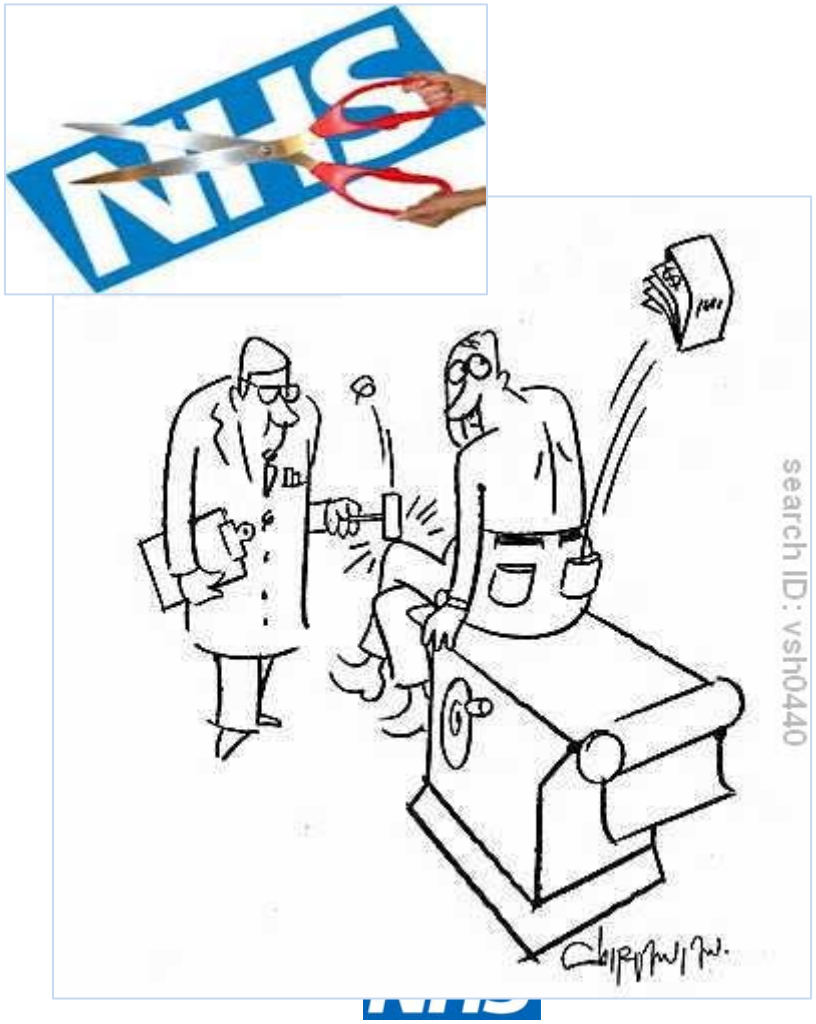
Cost savings & revenue generation



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The UK Outpatients Model – 18th Century Exemplar

Looks a bit familiar..?? – looks rather “austere” Has much changed in 200 years ? What to DO about it ? The “Einstein test?”

Innovation is the only answer but changing behaviour in a workforce of 1.4 millions is problematic

Adoption and Diffusion of innovation – slow in healthcare generally – this is nothing new

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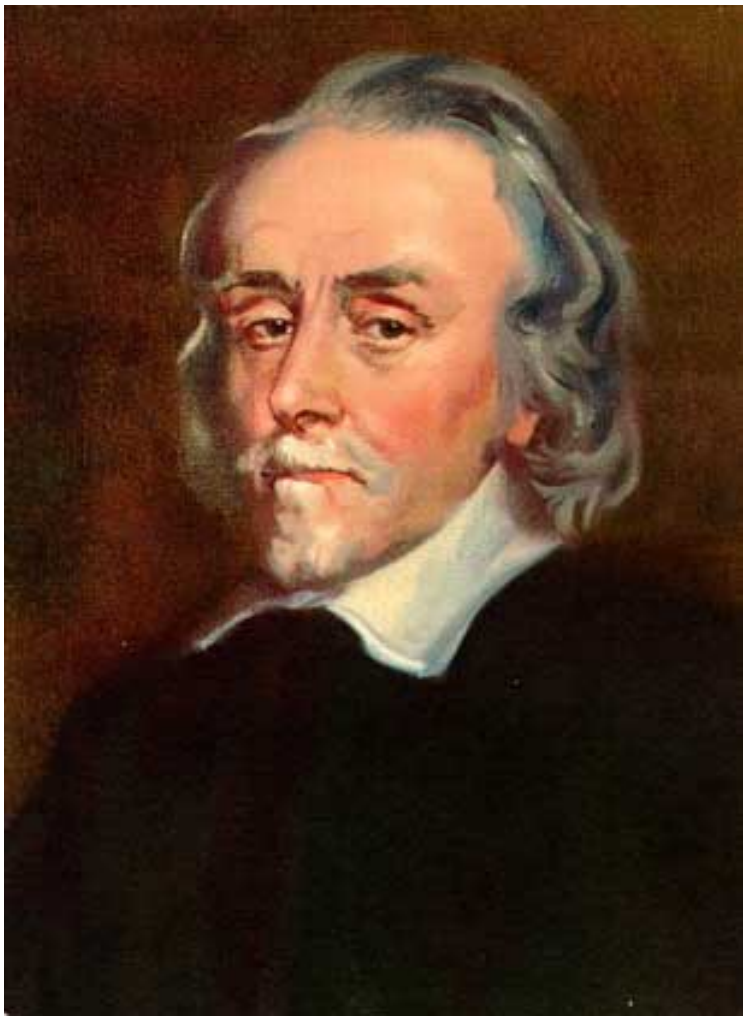
We speak a lot about “Adoption, Diffusion and Spread of Innovation and Best Practices” – are these *new* challenges in the Health and Medical fields ?

1618 – William Harvey – single circulatory system of our blood – one of the great discoveries in medicine



The struggle for acceptance and adoption….15 years of tough times

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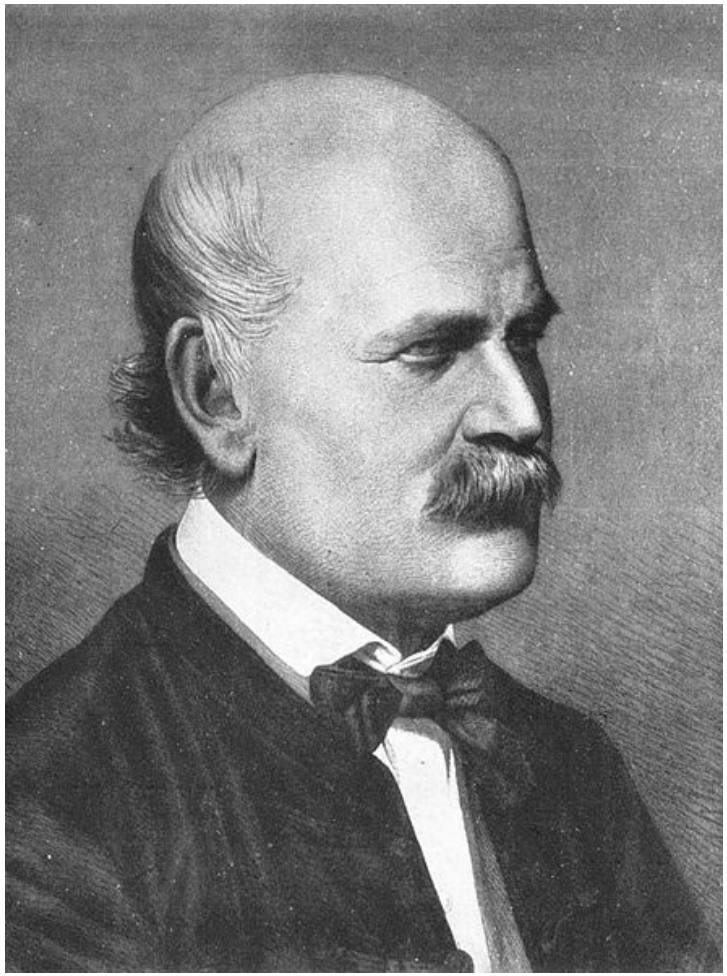
Great Innovations can meet even greater opposition

Ignatz Philip

Semmelweis



Wash hands

Classical work

1847

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Adoption of the Semmelweiss Innovation – still not there TODAY !

So Adoption and Diffusion of Innovation are key objectives for us NHS today. We are making progress – too slowly

Other great Innovators struggled to bring positive change….Marie Curie – how many lives has she saved ?

Ideas fiercely opposed at the outset

The struggle for acceptance and support – not to mention resources

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Others had to Improvise to Innovate – during very tough times

From old washing machines and car parts in occupied Netherlands to….

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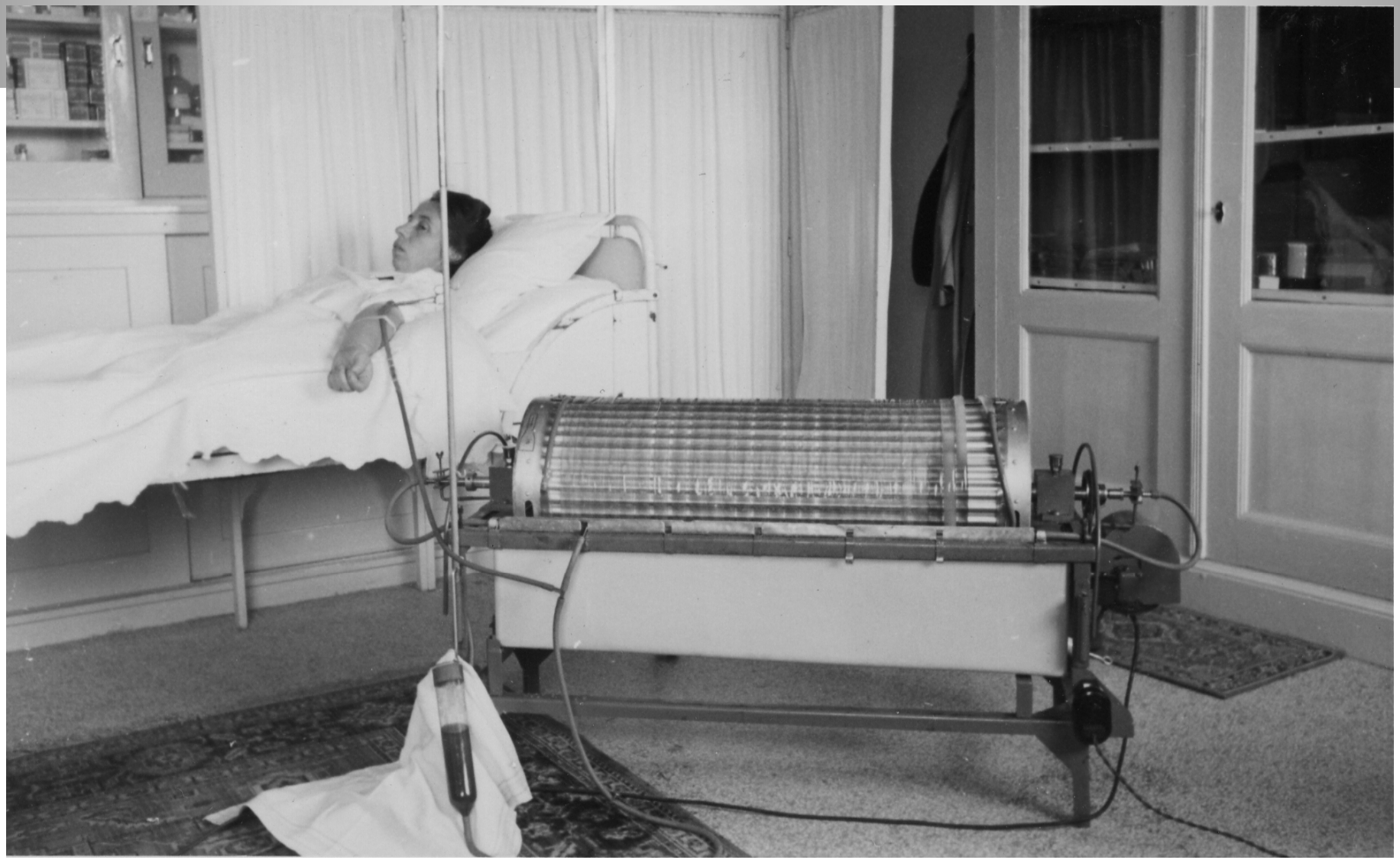

Willem Kolff's first Drum Kidney Machine - 1942

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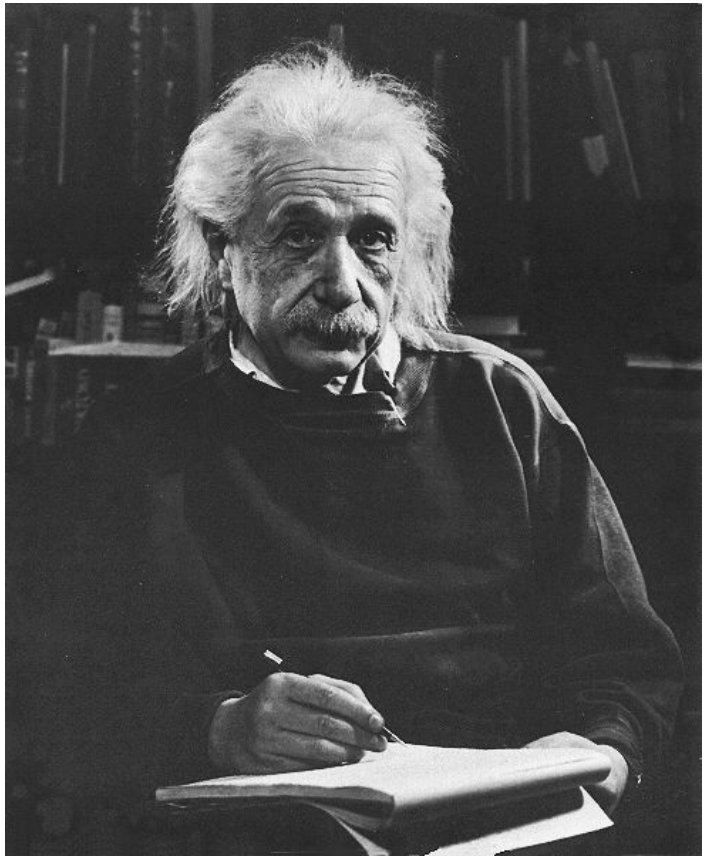
The Human qualities we seek to mobilise to secure positive changes

Starting with *IMAGINATION*



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Einstein on IMAGINATION….

“Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world”

Albert Einstein 1879 – 1955

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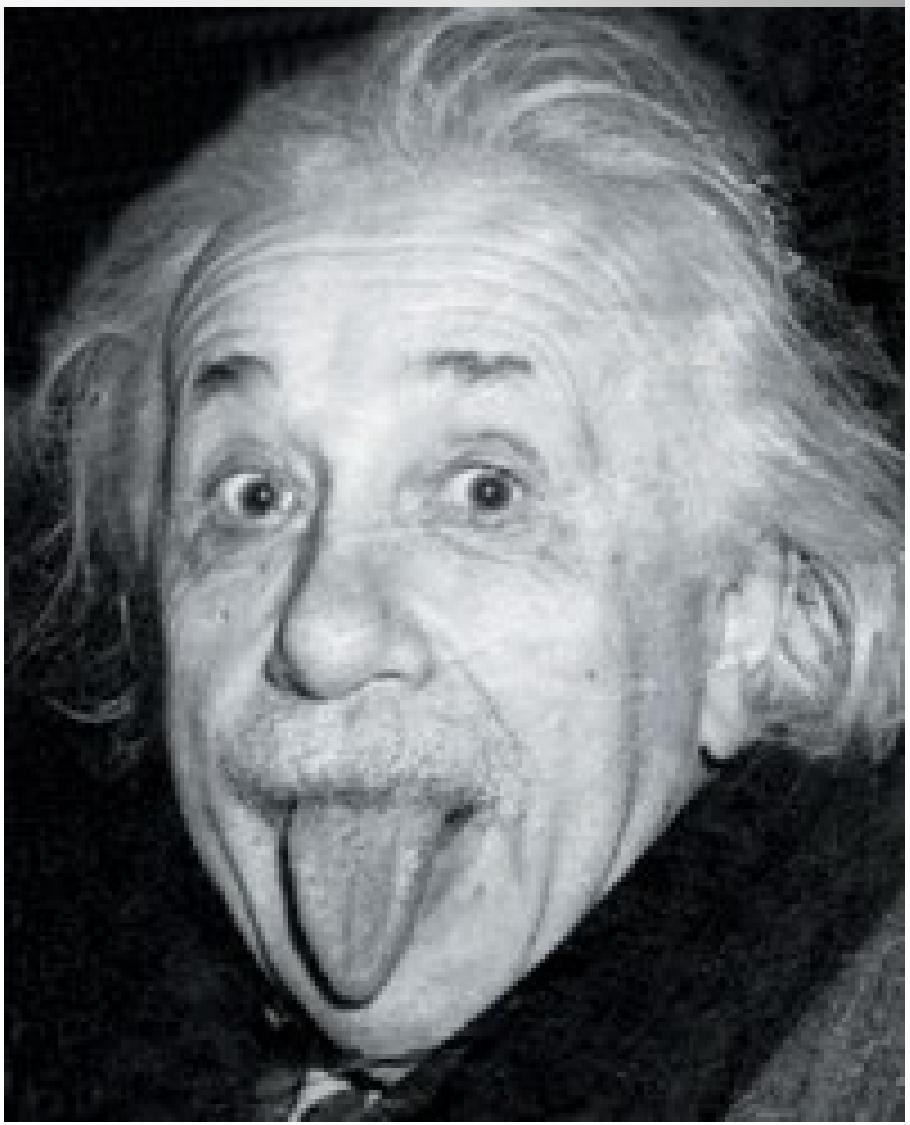
More from Albert….

Insanity: doing the same thing over and over again and expecting different results.

Albert Einstein



Imagination brings *Innovation* – and new ways of living

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“Brain Circulation” – for joined up thinking and lives

“Brain Circulation Across Borders and Functions”

“Open Innovation Thinking”

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Open Innovation: What is it?

- **What:**
  - **Shift from so-called closed innovation processes towards open way of innovating (Chesbrough: Open Innovation:The New Imperative for Creating & Profiting from Technology)**
  - **i.e. Creating innovative products and service through open collaboration**
  - **Collaboration in sharing content, data, ownership for joint innovation**
  - **Diverse teams: professionals, consumers, clients, communities, disciplines..**
- **Why:**
  - **Increased mobility of specialists - knowledge now outside large research labs**
  - **New knowledge flows between companies**
  - **New opportunities for spin-offs / new licensing agreements**
  - **New and diverse innovation and supply chain**
  - **Shift towards shorter research / production cycles in media industries**
  - **Rise of the consumer as co-creator (PPP)**

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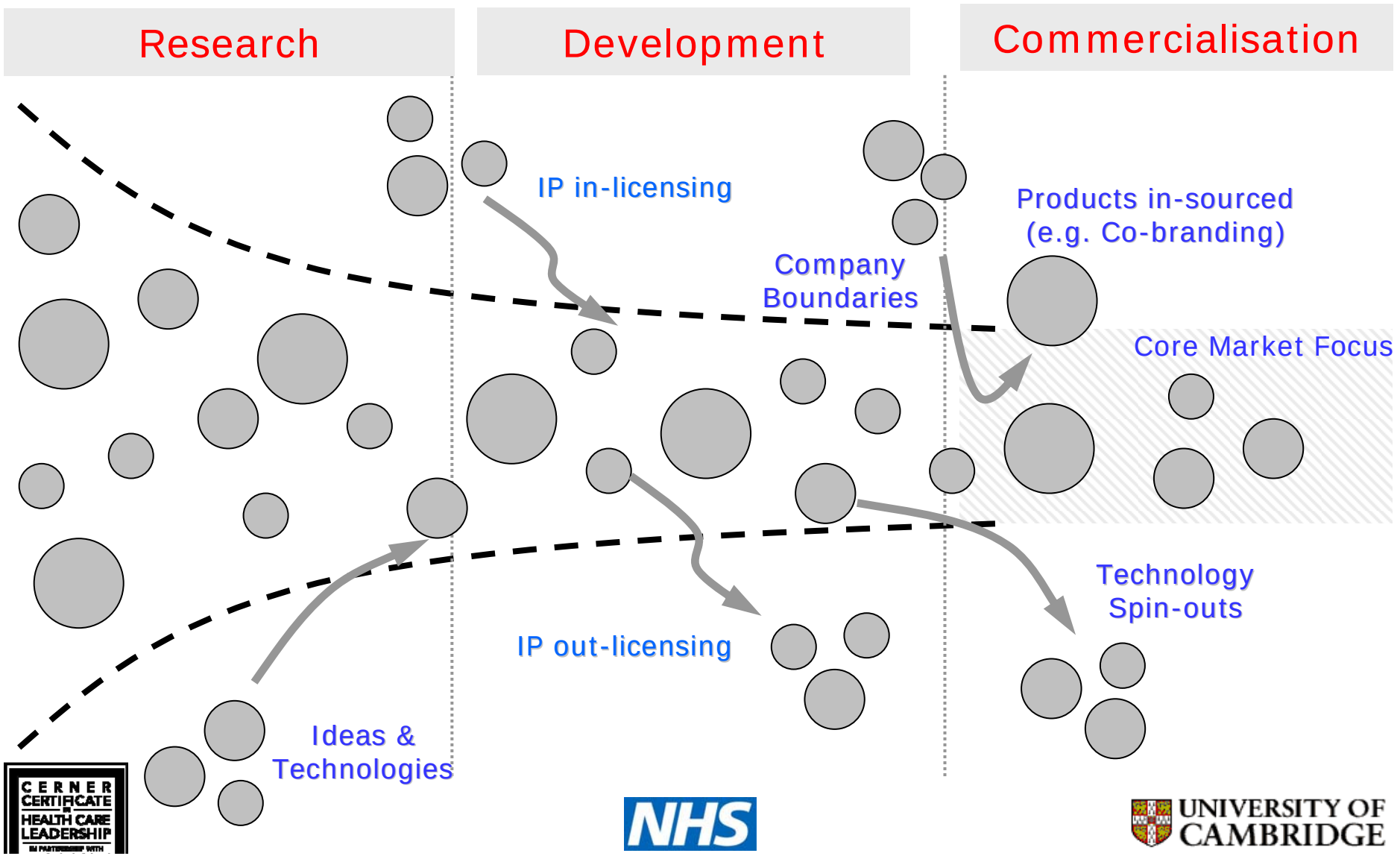
Open Innovation: Benefits and Issues

- **Benefits**
  - Far greater scale, frequency, innovation potential than closed process
  - Transcends and transforms fixed patterns and structures
  - Stimulates transfer of people, capital, goods, services, ideas, knowledge
  - End product closer to user base - consumer as co-creator
  - Move to develop new forms of shared Intellectual Property

- **Issues**
  - Need to identify trusted and dependable peers and partners
  - Need to transcend and transform fixed patterns and structure
  - Need to integrate different methodologies
  - Need to maintain own identity with shared ownership
  - Need to maintain privacy and security
  - Need for practical examples

A model of 'open innovation'



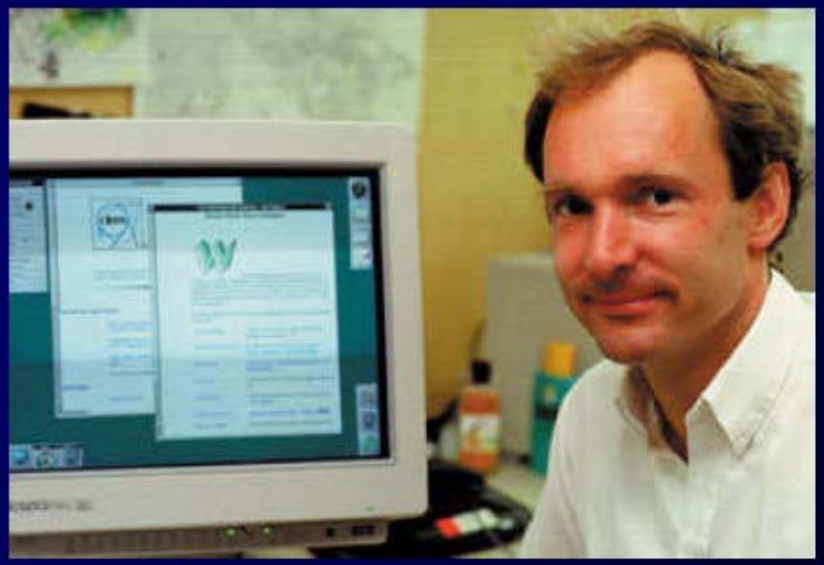
Docherty, M. (006), Primer on 'Open Innovation': Principles and Practice, pdma (Product Development and Management Association) Vision (April 006), pp.13-17.
Chesbrough, H. (003), Open Innovation: The New Imperative for Creating and Profiting From Technology, Boston: Harvard Business School Press.

Example of an important software innovation developed by a "Lead User:" The World Wide Web

The Internet has REVOLUTIONISED Product Development and Innovation in many areas – Berners-Lee was an ***"open innovationist"*** **Impact on Healthcare profound**

"Berners-Lee says, "it was something I needed in my work."

He wanted to solve a problem that was hindering his efforts as a consulting software engineer at CERN (a software user organization).



Innovation happens mostly with USERS not SUPPLIERS

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Encouraging the Entrepreneurial Spirit and Mindset in and around Healthcare

“You look at things and ask - why?

but I dream of things that never were and ask -

why not?”

Balancing Creativity, Innovation and Risk

George Bernard Shaw

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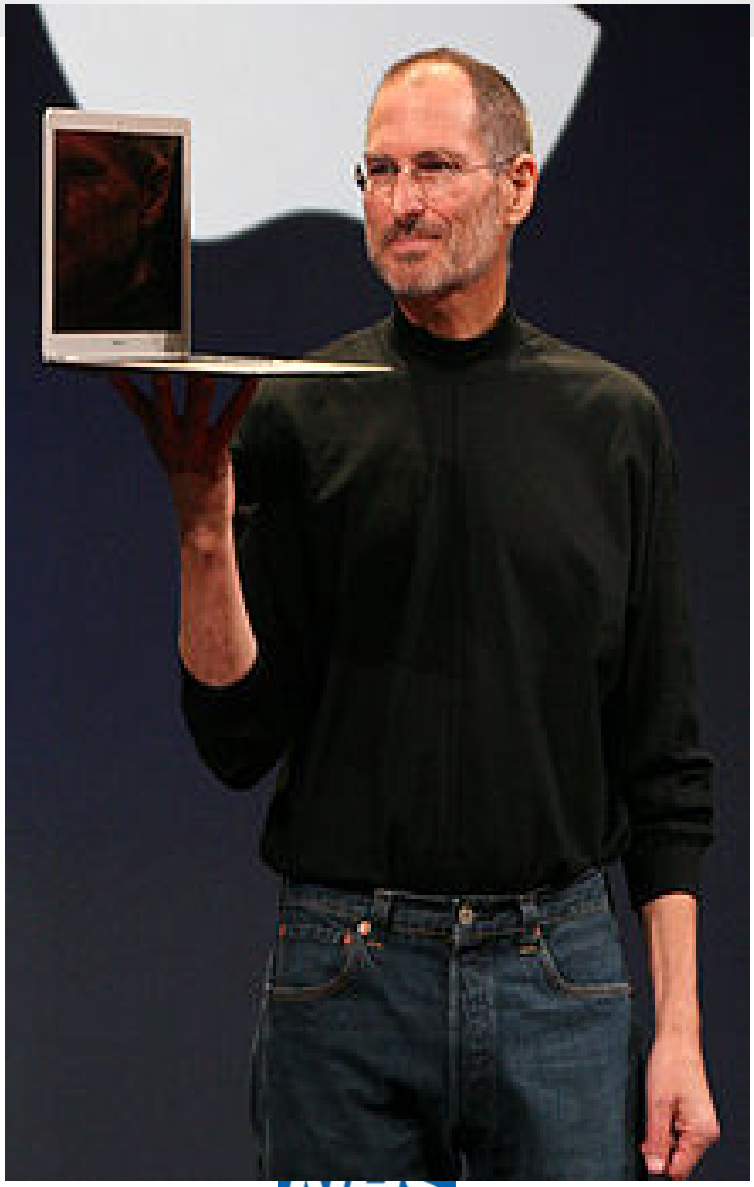
An Entrepreneur who changed the world – in his lifetime and changed our lives – we need more such in Healthcare

Personal Computers

Mobile phones/ smart phones

Animation in films



Digital Publishing

Delivery of Music

Tablet Computing

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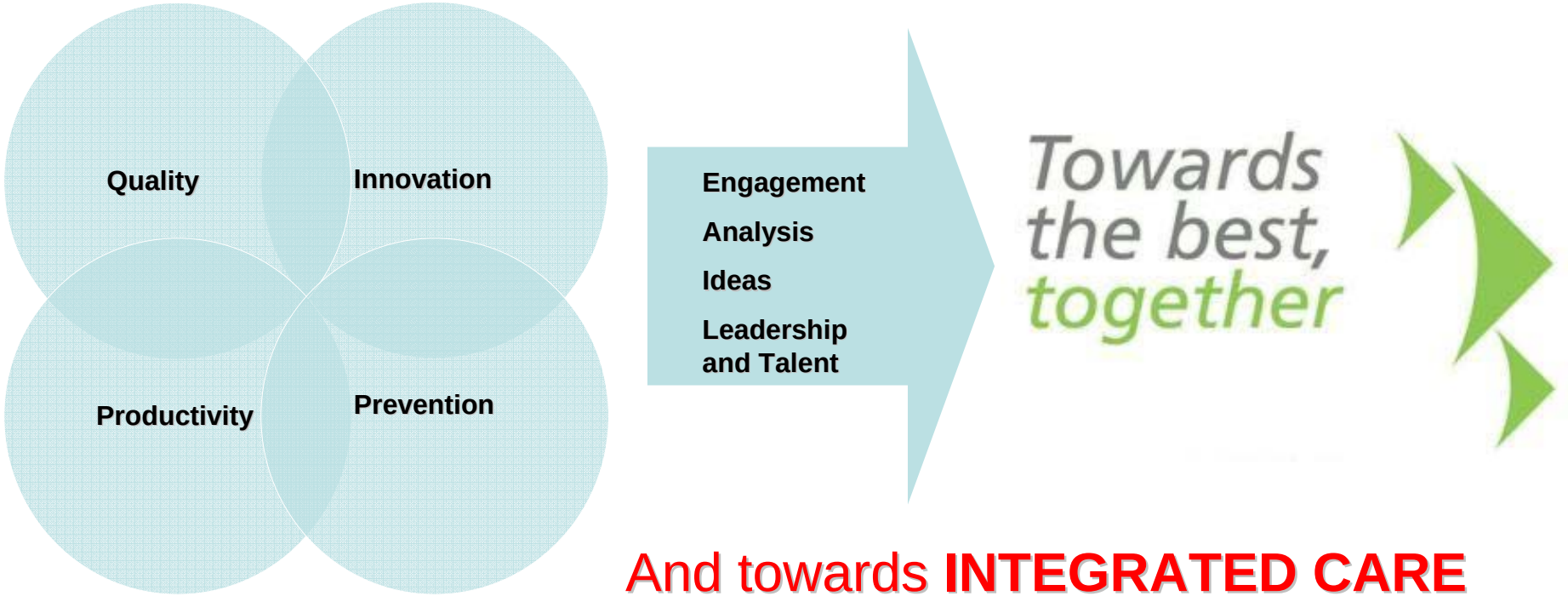
Quality, Innovation, Prevention and Productivity

QIPP – finding and spreading the best practices

QIPP – Becoming a Way of Life in UK



And towards **INTEGRATED CARE**

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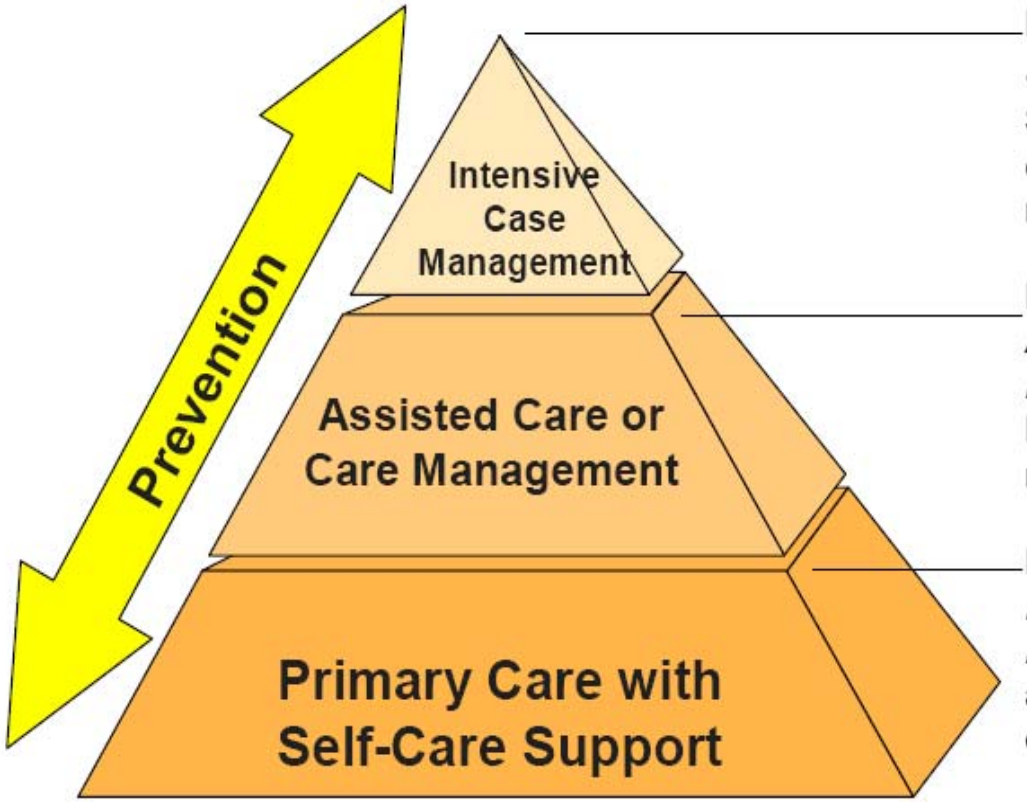
NHS East of England

The Kaiser Model is also about QIPP

Chronic Conditions Management

Addressing all levels of care needed by a population



LEVEL 3 (1% -5%)
Intensive Case Management
Specialty MD care coordination with care/case management, eCare

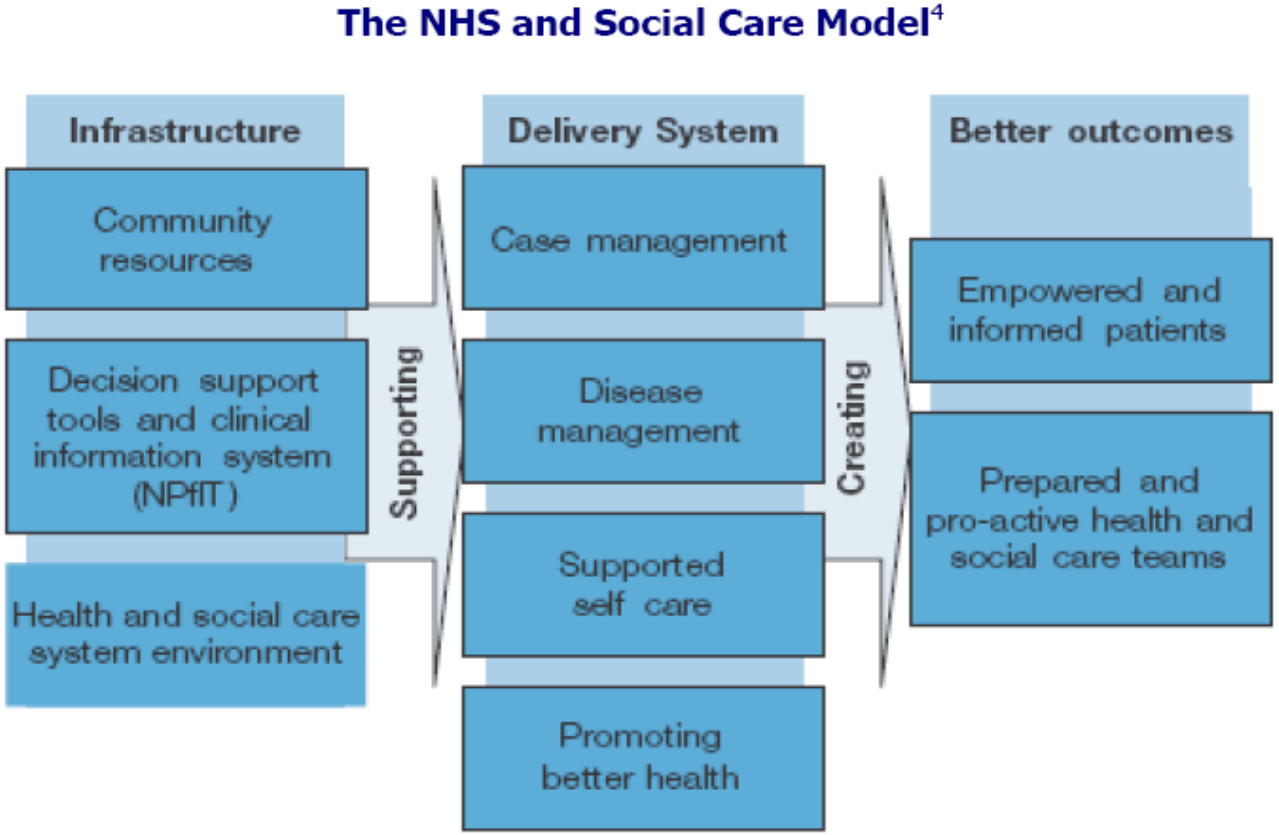
LEVEL 2 (20%-30%)
Assisted Care or Care Management with nurse, PharmD, or PMA care management with MD, eCare

LEVEL 1 (65%-80%)
Routine care delivered by Primary Care Team, as well as self-management education.

KAISER PERMANENTE

Worth looking at Finland's approach too…..

There are many “macro models – but “the devil is in the detail” and the outcomes depend on multiple factors



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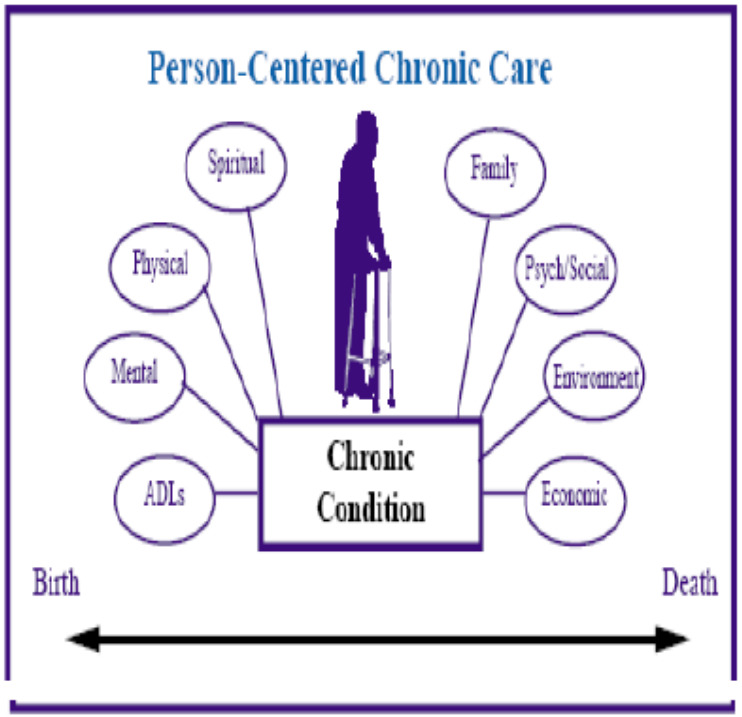
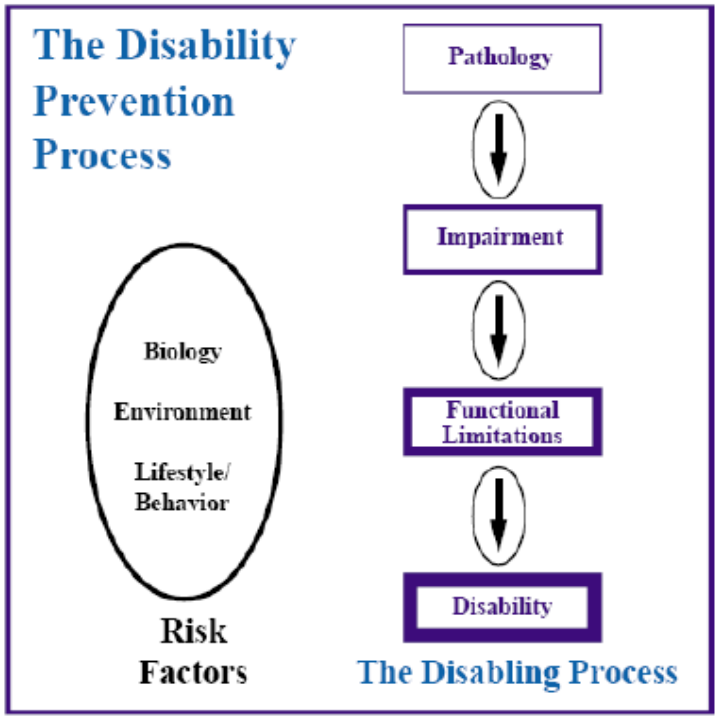
Scotland's Model for Integrated Care

Aiming to prevent Disability and LTC needs

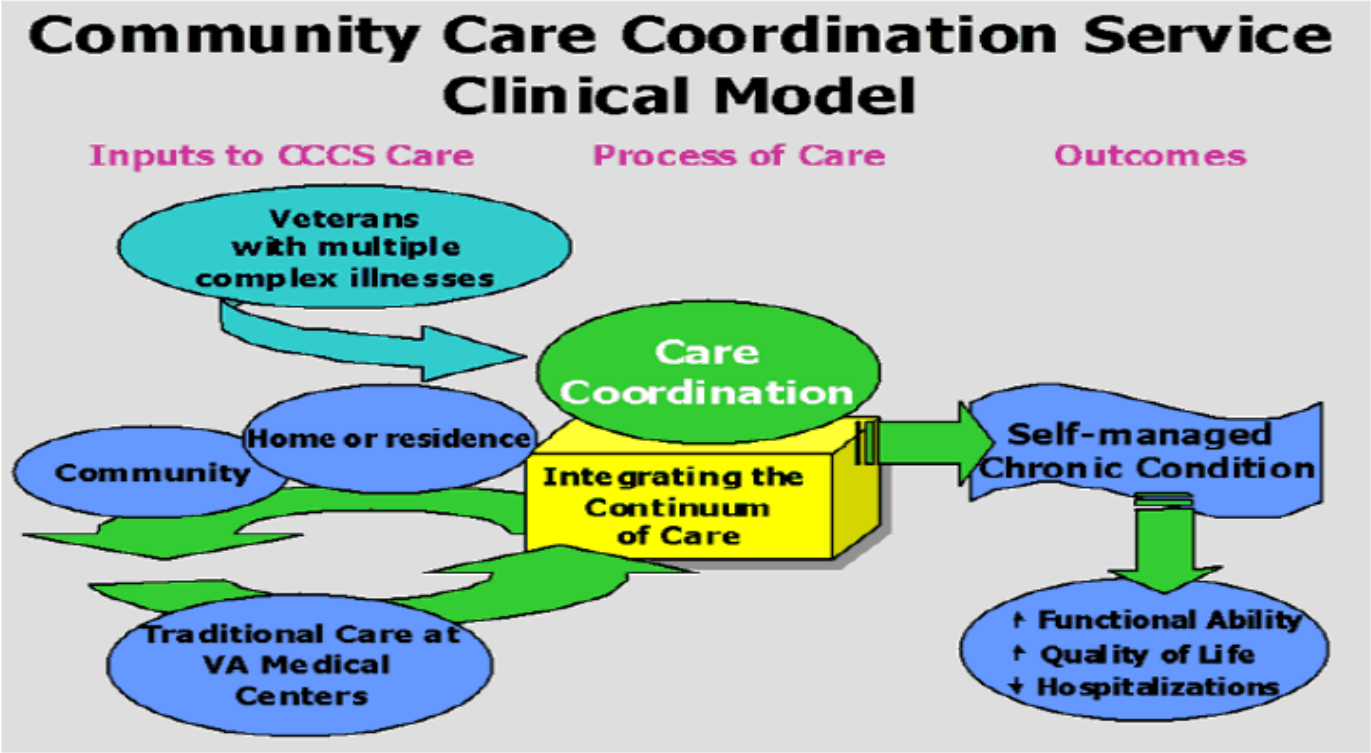
Key elements of pre-Chronic Care Model frameworks in the US[125]





Community Care and Self Management Model

Veteran's Affairs Care Model[127]



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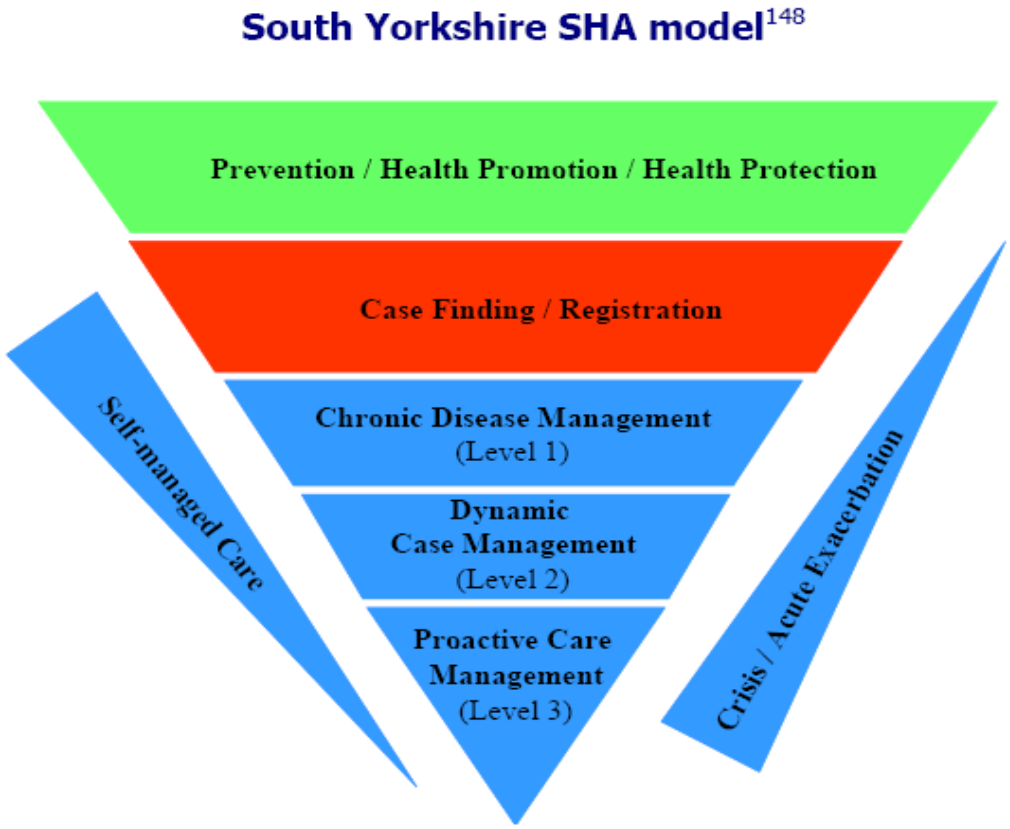
The principles of ALL are the same "QIPP – Quality Innovation Prevention and Productivity". Variations on the theme



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Healthcare in a World Without Borders and Barriers messages delivered to UK NHS workforce

Creativity, Innovation Centrality of the Patient

“No decision about me without me!”

From rhetoric to reality – “making it happen”

Harnessing technology to accelerate progress

Financial performance will follow the quality achievements

Learning from WHEREVER we can find the best or better way of doing things. *Open minds and Open Innovation.*
Making a great NHS even greater !

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To develop a Sustainable System in UK and other Western Healthcare programmes will mean….

- Care closer to home – and *Care* at the forefront of mindset
- Earlier intervention
- Fewer acute beds
- More standardisation *integrated care*
- Empowered, informed patients – "The Patient Revolution"

"No decision about me without me"

- Reduced unit costs

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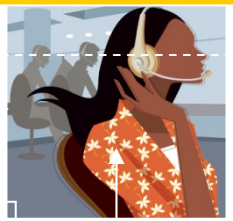
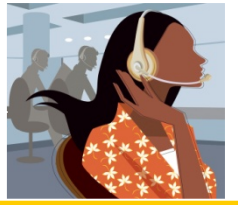
The Future - Supported Self-Care as a preference

County Council





District Council

Cambridgeshire and Peterborough Sustainable Healthcare Partnership

AfterCare Card NHS

Call 0800 1223 123

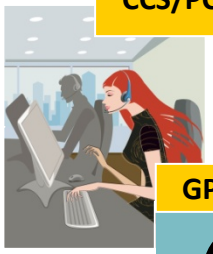
Member Number

1234.1234.1234

A.PATIENT

Aftercare Call Centre

CCS/PCS



Hospital Discharge

GP receptionist

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Information Delivered to the Cell Phone in Your Pocket – E-Health and M-Health – Telemedicine Regional Programmes The Digital Health Revolution supporting the Patient Revolution Worldwide

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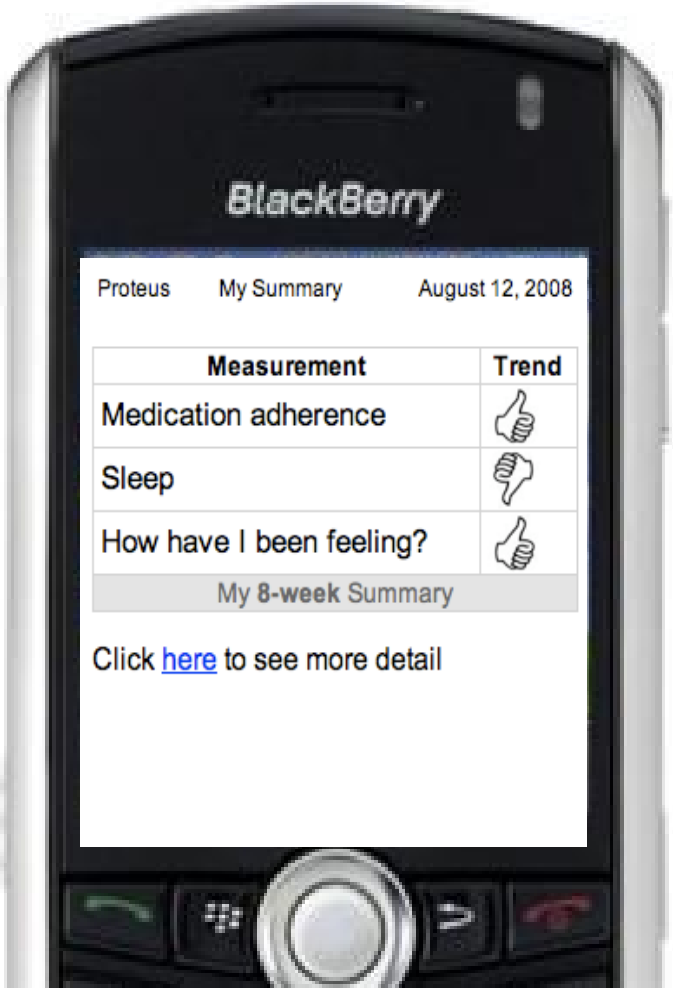
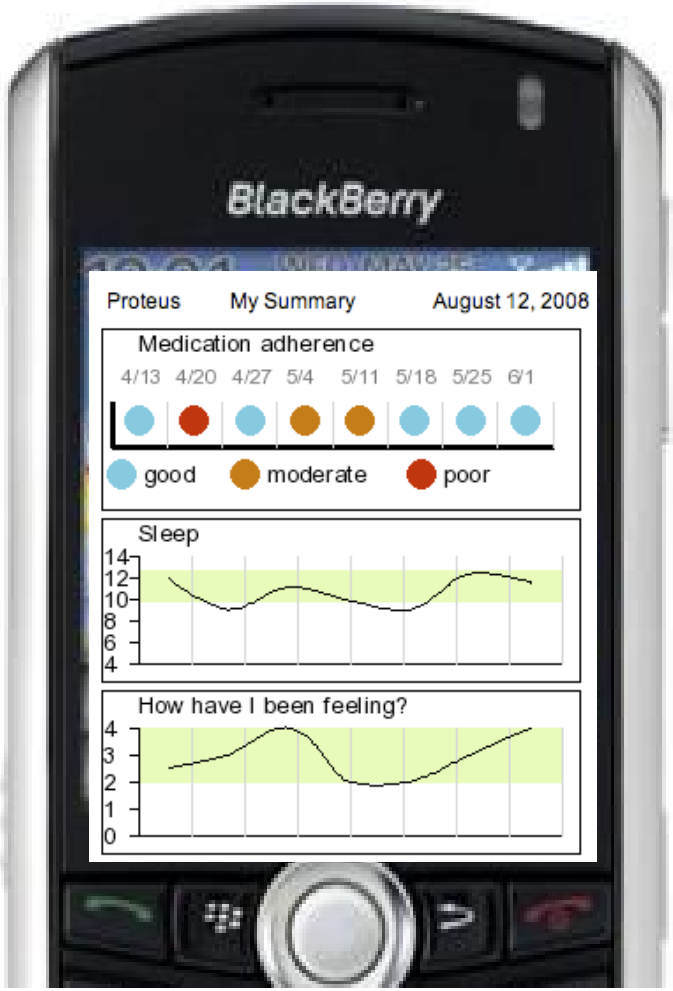
Information Delivered to the Cell Phone in Your Pocket
And made available to ALL you want to share it with.
Patient empowerment and shared decision making



Simple View



More Sophisticated View

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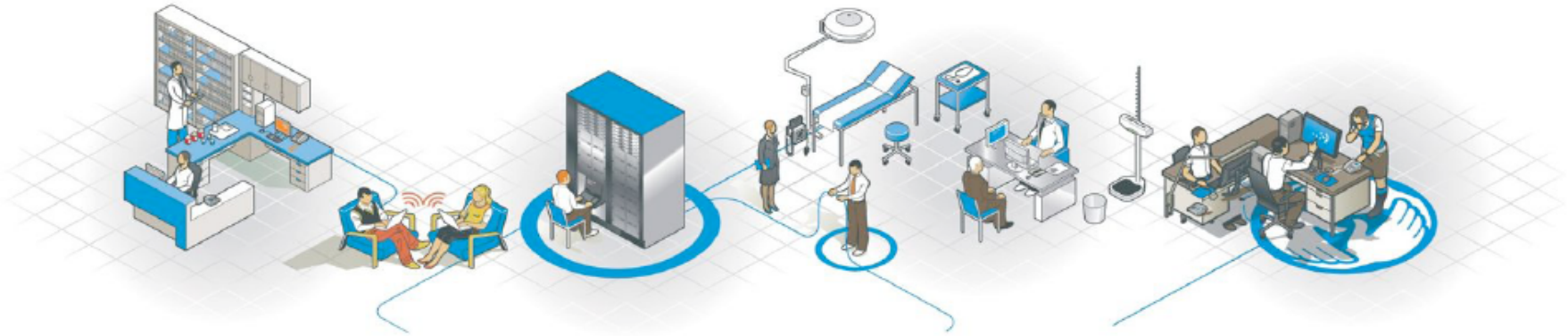
how are you?™

how are you?™



The Social Network for Health

IET AWARDS The Institution of Engineering and Technology | INNOVATION WINNER 2011

Cambridge Healthcare™

NHS Connecting for Health | BMJ Group | NHS

The NHS Innovation Council – EoE – ongoing support in Health and Social Care

- Strategic Focus – Direction, Advocacy and Leadership
- Broad spread of membership – aiming at a coalition of partners across the Region
- Oversees the Regional Innovation Fund (RIF) allocation and management
- Focus on Innovative Commissioning Procurement and Asset Management
- Promote Leadership to develop an Innovative Culture
- Help ALL confront challenges and consult widely – support justified transformational change
- Develop a new and meaningful Compact with Industry
- “Joining Up” for greater coherence and effectiveness.
- Supporting Innovative initiatives +++++
- Enabling and Encouraging Adoption and Diffusion
- Annual EoE Innovation Report

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Building Bridges for a better Health Systems
Compact with Industry

Understanding and being embedded in the NHS and Healthcare system

Understanding and working closely with Industry

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Innovation support and Knowledge Transfer in the UK Health System

- NHS Innovations East part of a National network of 9 groups across England.
- Provide Intellectual Property and Knowledge Transfer Services to NHS Trusts in the East of England
- Benefit to patients, staff & wider healthcare sector – Innovation, Adoption, Diffusion ++++
- Record of Effectiveness and Success over six years
- 60 “Innovation Scouts” in place to support innovators in EoE

Organised and equipped to support Industry engage with NHS – Innovation IN ! For HEE an equally important objective. Active in the Innovation Council. Building Bridges.

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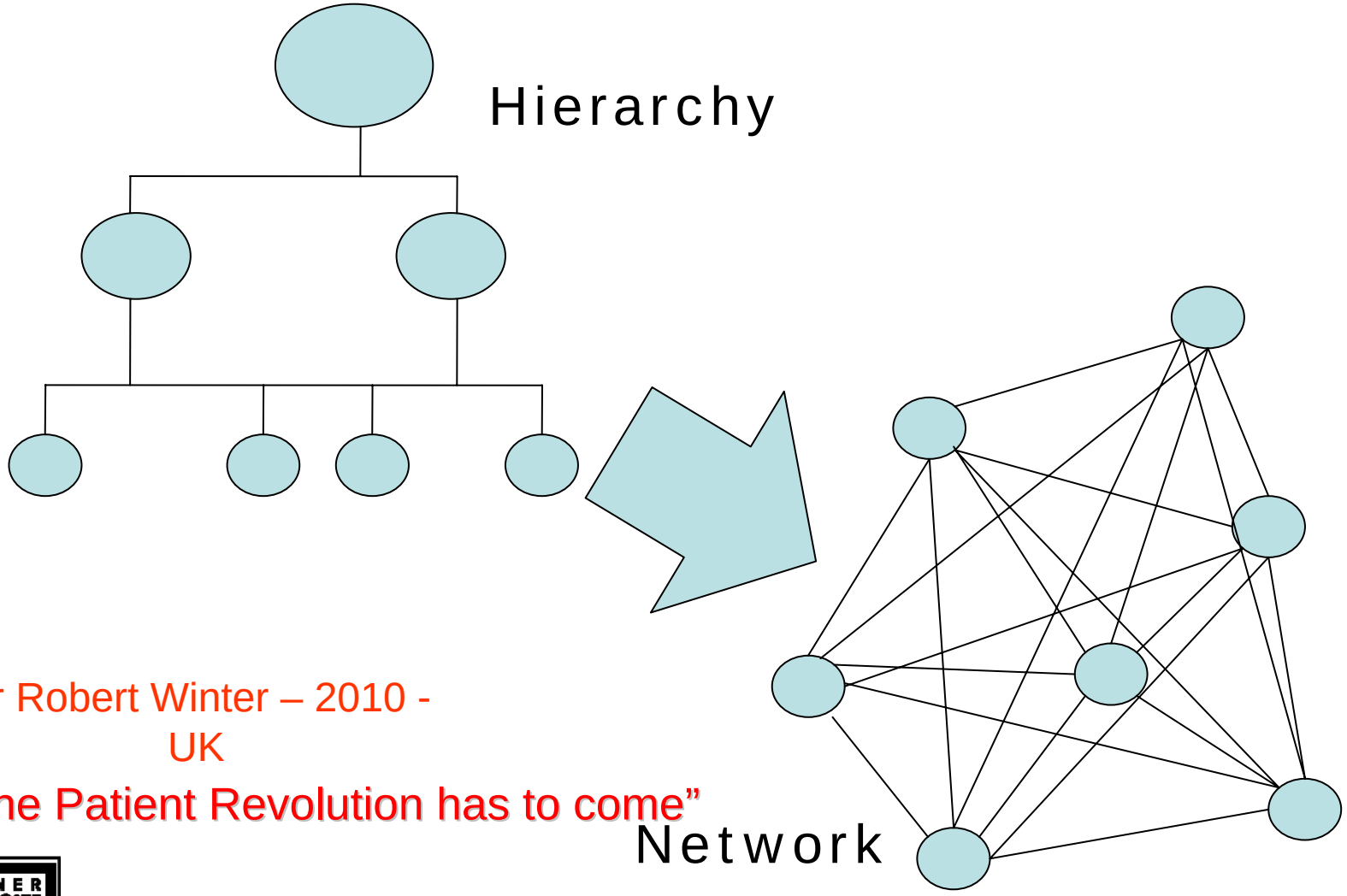
Medicine beyond 2020 – let's look ahead



Dr Robert Winter – 2010 -
UK

"The Patient Revolution has to come"

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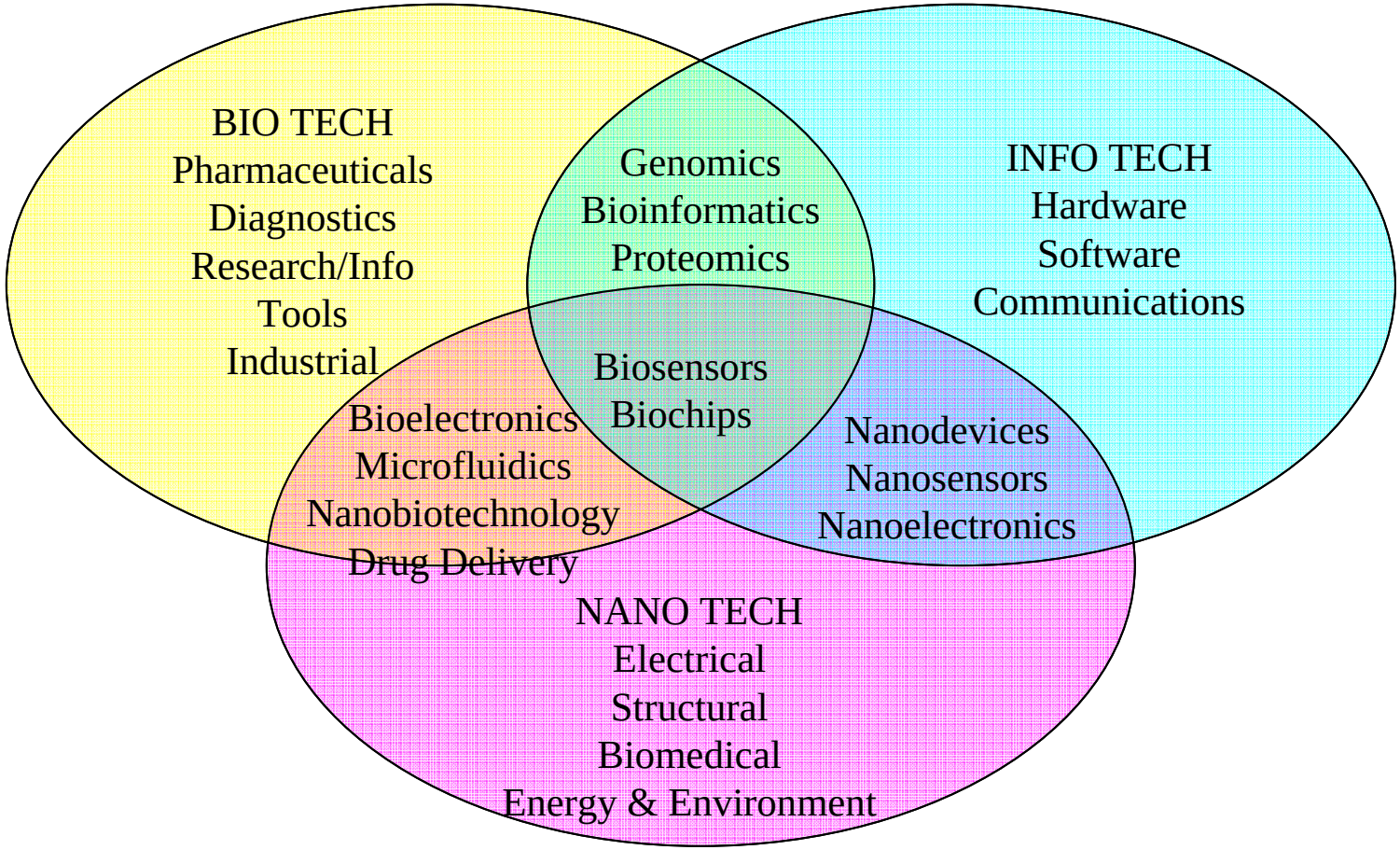
Three Converging Revolutions

Three Pervasive Technology Platforms which will impact Healthcare



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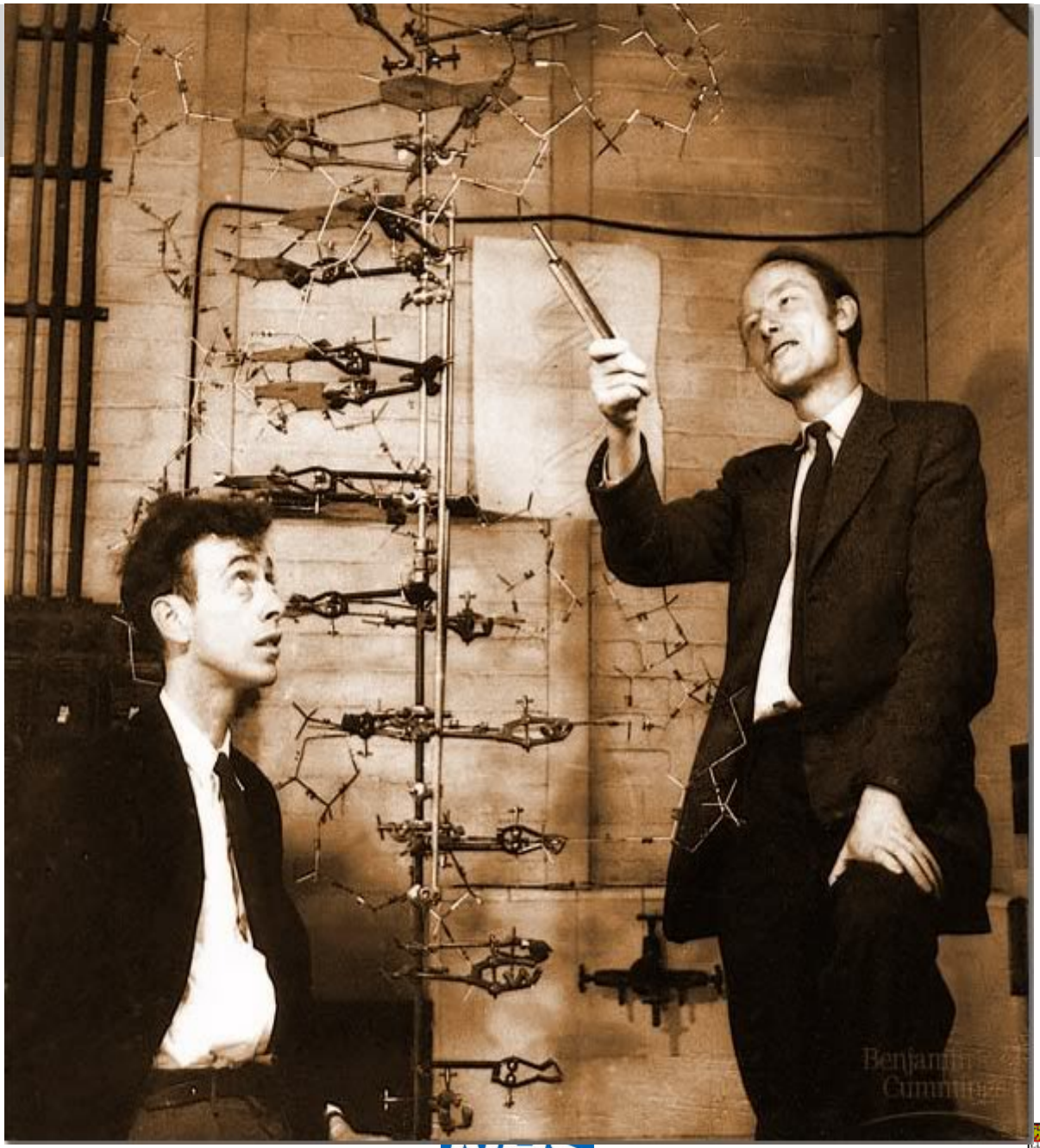
Open Innovation enables transfer of tacit knowledge

James Watson and Francis Crick and the Double Helix Model 1953



Open Innovation at The Cavendish Laboratories

Physicists changing the face of Biology

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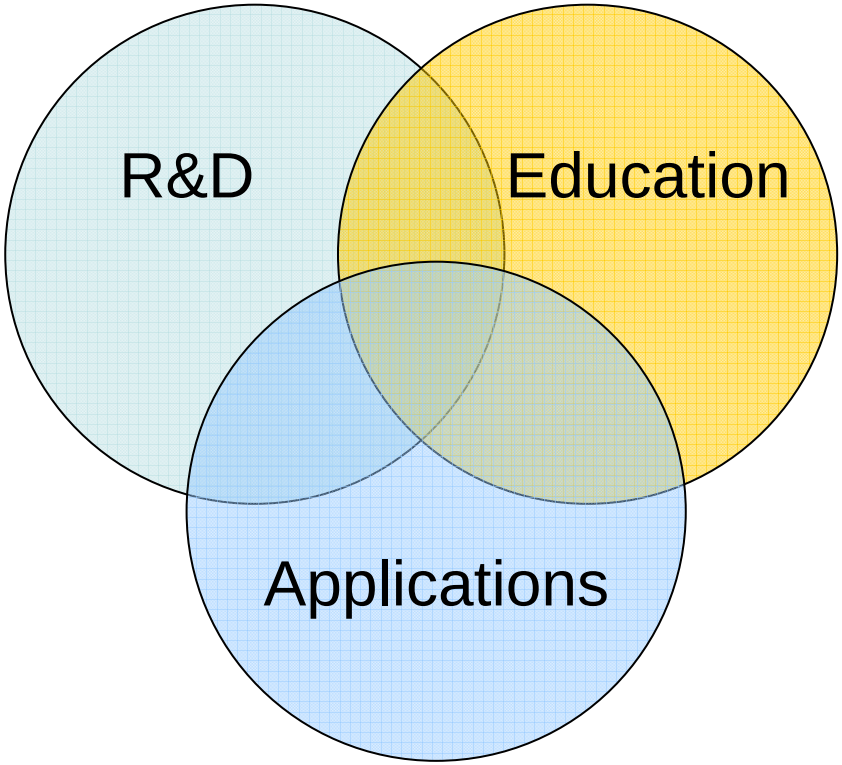
Proximity of Learning, Research and Practical Application

"The Innovation Campus" especially the "Health Innovation Campus"



Where open innovation, symbiosis, synergy and new companies can thrive

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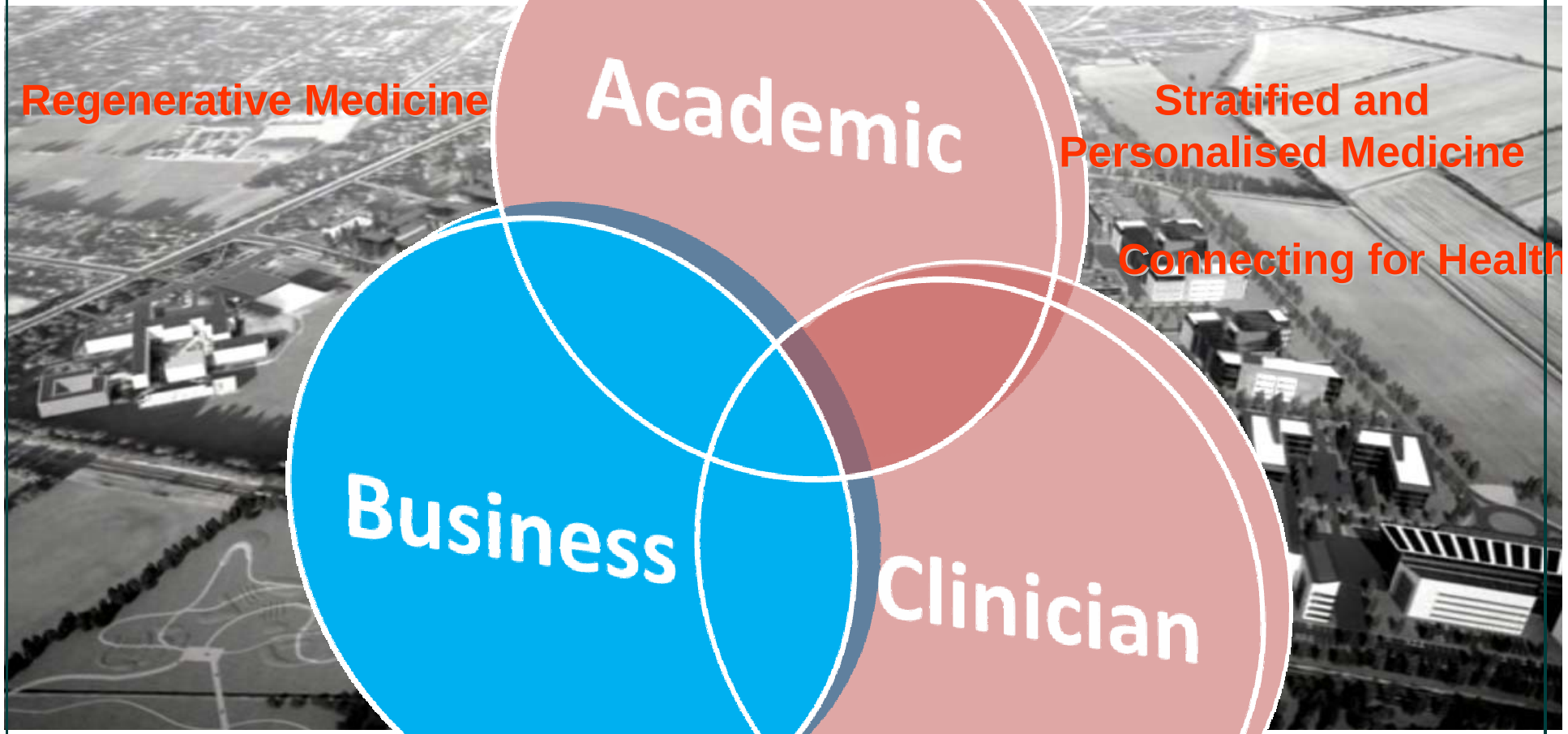
Emerging UK Model for the Future

The Academic Health Partnership



Regenerative Medicine

Stratified and Personalised Medicine

Connecting for Health

Connecting research with practice

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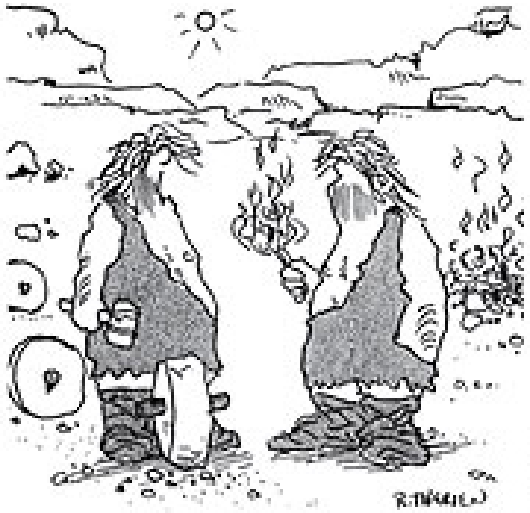
Industry-academic Partnerships

- Fill gaps
- Complement in-house capabilities
- From research to delivery through trials and practice



"If you ask me, between your stuff and my stuff, there's just nothing left to invent."

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The Biomedical Industry

- Pharmaceutical – drugs
- Biotechnology – drugs, technologies and services
- Regenerative medicine/stem cells - therapies, technologies and services
- Medical – devices, diagnostics, equipment, services
- Parallel activities in Diagnostics and Therapeutics most go hand in hand for stratified / personalised medicine

“The Reinvention of the Pharmaceutical and Medical Products Industries”

The rise of China and other developing nations as leading developers and suppliers.

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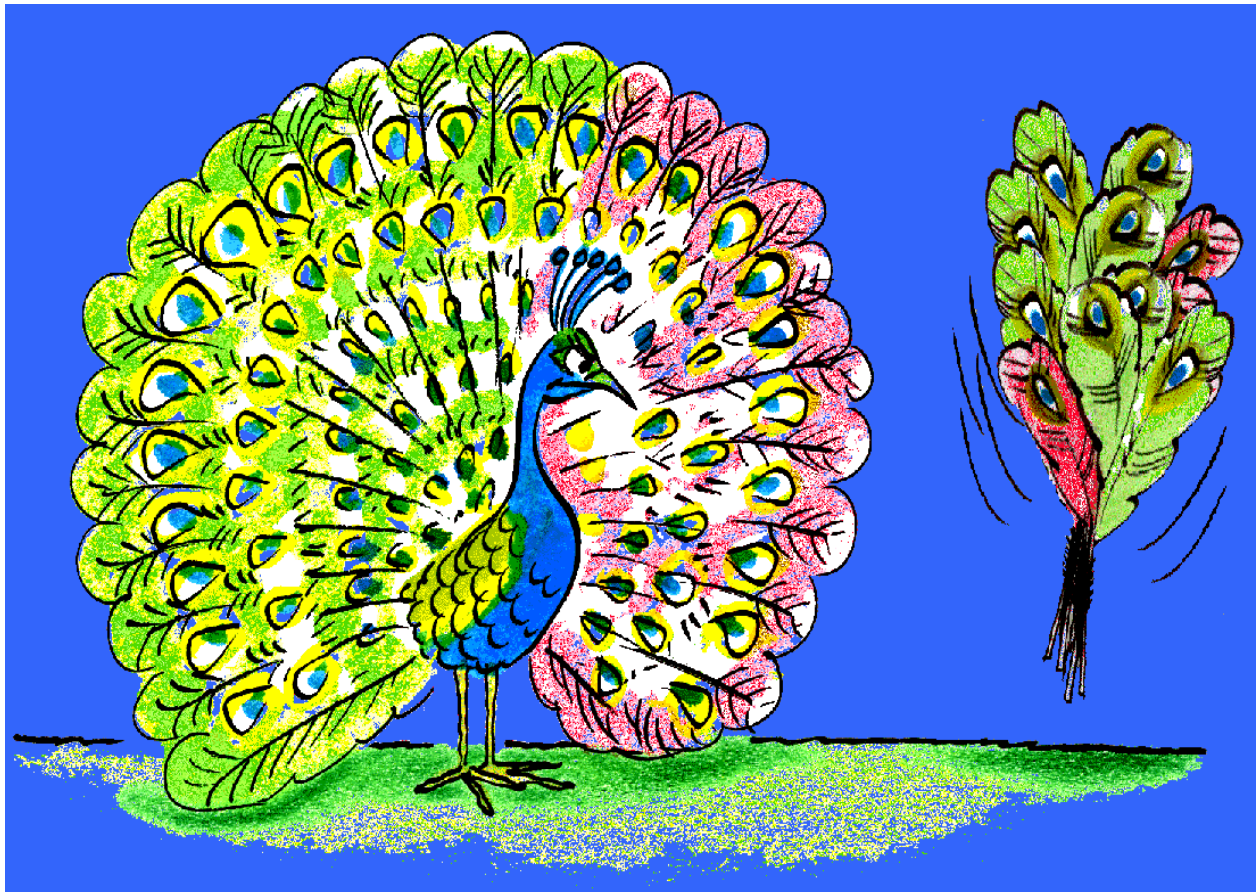
The Big Pharma and Bioscience Companies – message - Sticking to those old ideas of Competition and Protection – "Today's Proudest Peacock could be Tomorrow's Feather Duster"



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Responses have included….

- Closures
- Off-shoring
- Out-sourcing
- M&A

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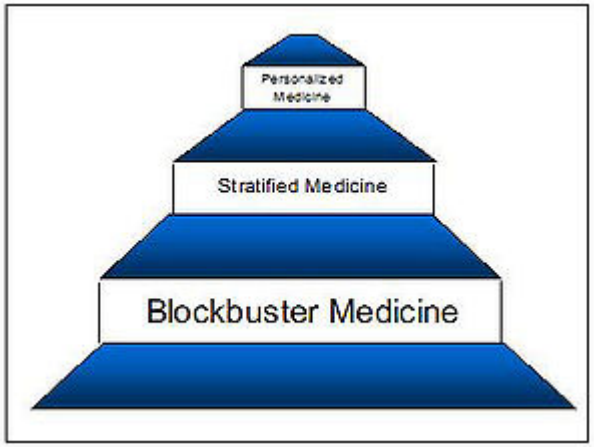
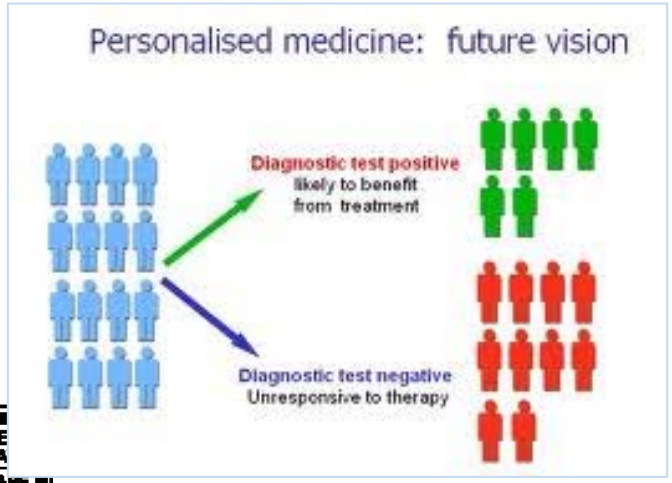
Reinvention – M&A

New Era of Personalised Medicine





- Drug failures
- New reimbursement models
- End of the blockbuster?
- Patients/Volunteers
  - -Records
  - -Samples
- Data mining
- Pathology
- Imaging
- Pre-clinical
- Clinicians
- Clinical facilities
- Diagnostics expertise

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Biotechnology industry

- Tighter regulation
- Higher drug failure rates
- Lower approval rates
- Fiercer competition
- Reimbursement
- Lack of finance

Long Route to Market …… "a bit like betting on the horses"

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Medical Devices/Equipment

- More sophisticated
- Closer relationships between developer and end-user
- Co-development
- Embedded labs in hospitals
- Beta- testing
- Market pull –v- technology push
- Accelerating market growth – China very active

Home and Community Care demands more effective Point of Care Diagnostics and “joined up information” – to reduce hospitalisation.

Industry as partner in Healthcare from need / idea / to product at the bedside.

IT connectivity essential

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Industrial response to needs in Long Term Care – an example. A company transforming itself – patient focused. Open Innovation at work where Philips is focused

Motor disability

- 18% of >65 has issue of walking > 0.5 mile
- 3% of >65 has issue of getting around in the house

Fall and fall-related trauma

- Fall injuries above age 65 often lead to semi-permanent impairment (e.g. spinal cord injury)

Diabetes

- Average age of patients is 57
- 15M diagnosed diabetics in the US

Stroke

- 71% of stroke happens above age 65
- 950K annual stroke victims in the US
- 50% end up with motor impairment

Diabetes peripheral neuropathy

- 30% of diabetics have impaired sensation in the feet due to peripheral neuropathy

Arthritis

- 43M US citizens suffer from osteoarthritis, of which 7M have chronic joint issues

Congestive Heart Failure

- 90%+ is above 65 years old
- Nearly 5M Americans are living with heart failure

Coronary Heart Disease

- 13.2M patients are in the US in 2003

Hearing loss

- Majority of hearing aids users are above 65 years old

Sleep disorder

- >50% of age >65 experience sleep related issues, e.g. insomnia, sleep apnea

COPD

- Average age of patients is above 65
- 12M COPD patients in the US

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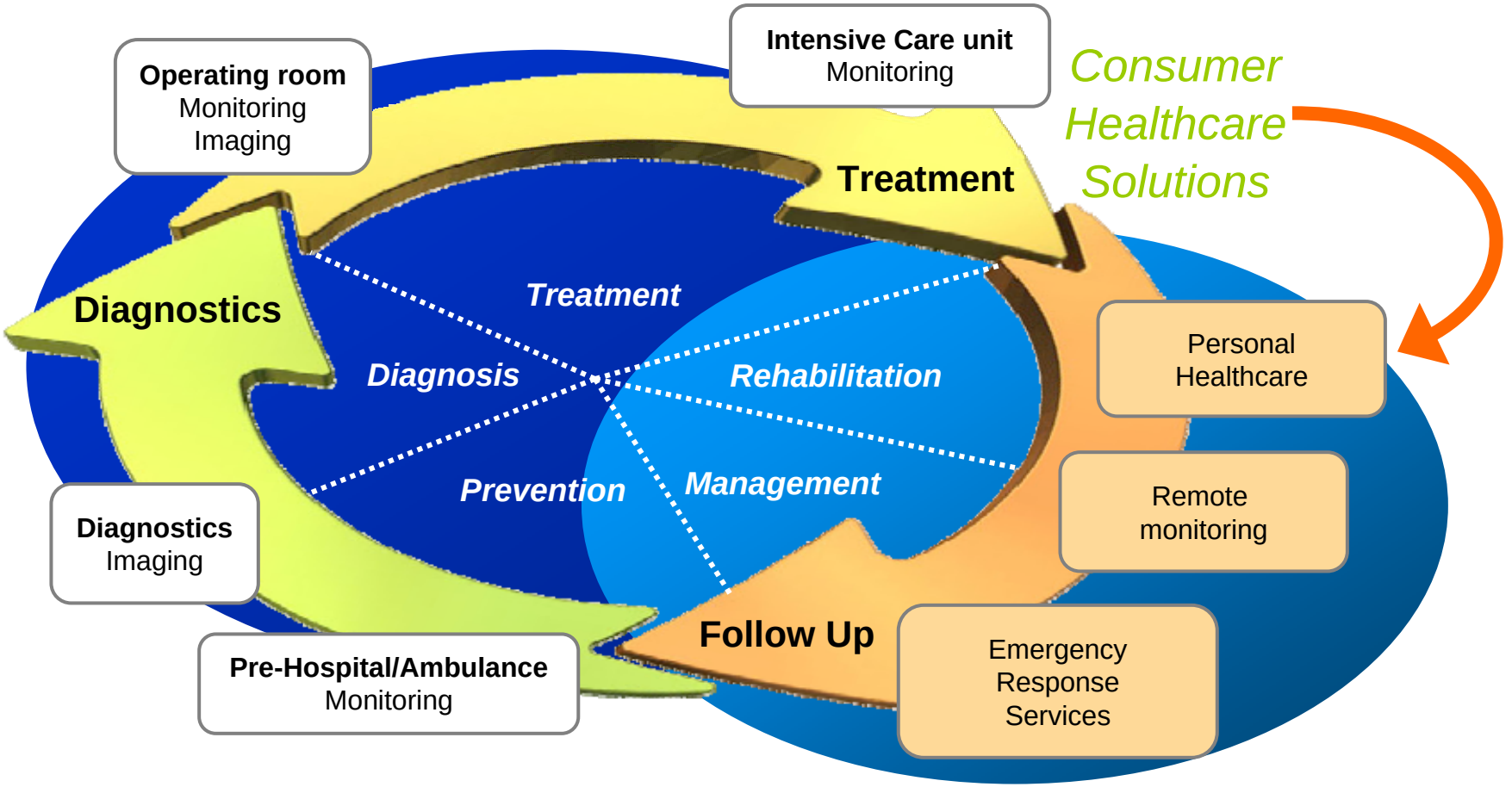
PHILIPS is present across the entire care cycle

- extending healthcare from the hospital to the home



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Medicine beyond 2020 - drivers for change in developed economies

- New diseases/new discoveries
- More informed and empowered population
- Demographic changes
- More individualised prevention and treatment
- Different models of care
  - Care closer to home / near patient testing
  - More creative use of ICT (monitoring, communication…)
  - New treatments for chronic disease (eg diabetes)
  - Ethical issues eg de-medicalising care of the dying
- Incentives to stay well and be treated out of hospital

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Looking Ahead….Exploiting the Future

- Managing through uncertain times
- Creativity, Imagination and Innovation
- The Entrepreneurial Spirit
- Leveraging Science and Technology
- Having a Global Mindset – Knowledge Sharing and Open Innovation
- Cross Border Alliances
- Transformational Education – more emphasis on Enterprise
- Healthcare Global – Healthcare Without Borders
- Regionally and Locally – "Joined Up" Communities and Society

And in Global Healthcare – exciting specifics – some already happening – some still "visions"….

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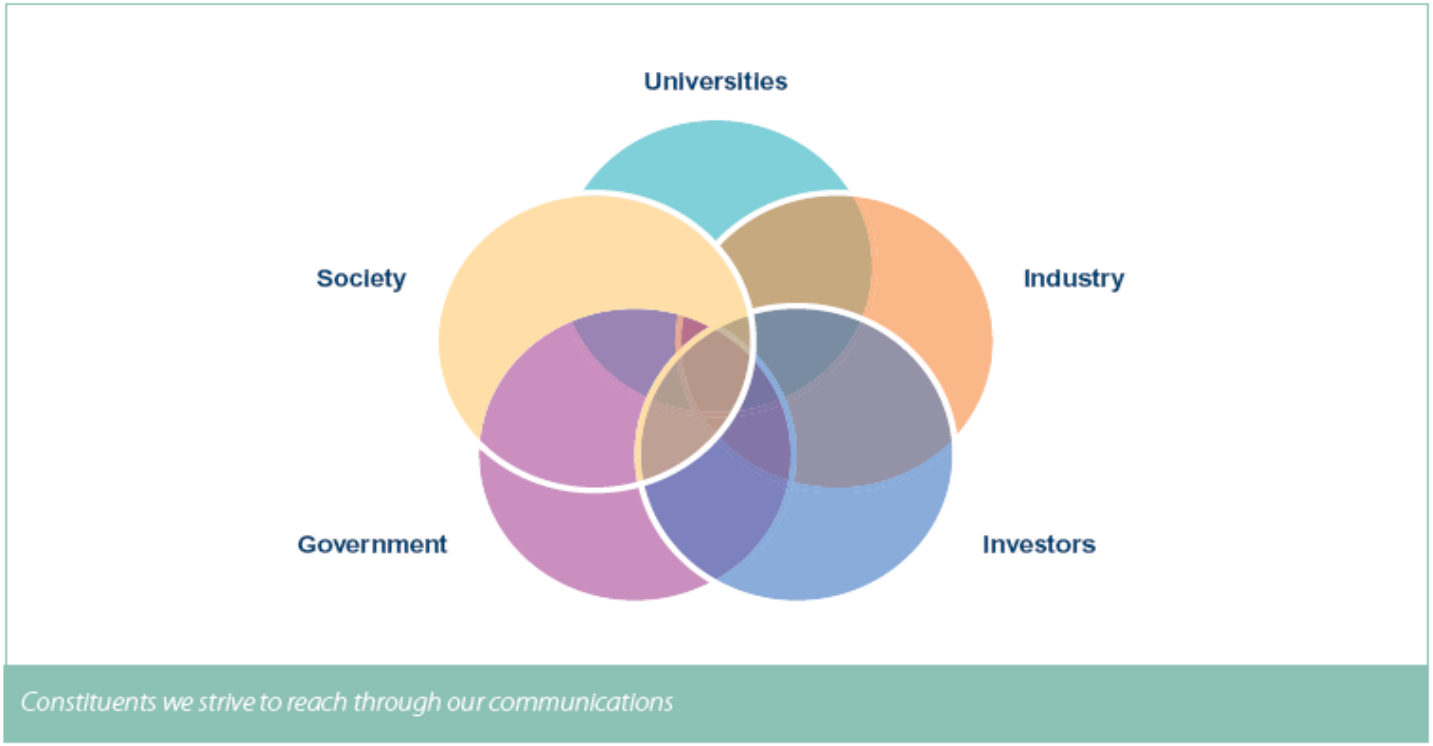
A Joined Up System and Society – for making Innovation work – Healthcare included



An Imperative to optimise Technology and Knowledge Development and Transfer. An Entrepreneurial Ecosytem.

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'It will be this synthesis, I believe – the balance between the physical, the psychological and the spiritual frames of reference - that will be the basis of a new, wiser and more integrated approach. It will provide a more balanced and therefore more hopeful human future. It will be, I dare say, a new kind of modernity.' *A speech by HRH The Prince of Wales to the Royal College of Physicians Conference, 21st February 2005*

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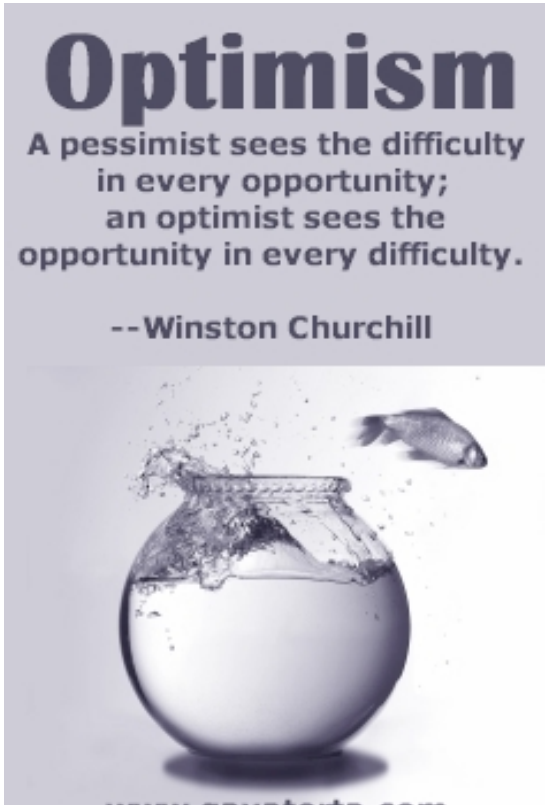
And finally:



Thank you for listening

Happy to discuss more and exchange information….

www.alanbarrell.com

www.hee.org.uk

www.howareyou.com

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