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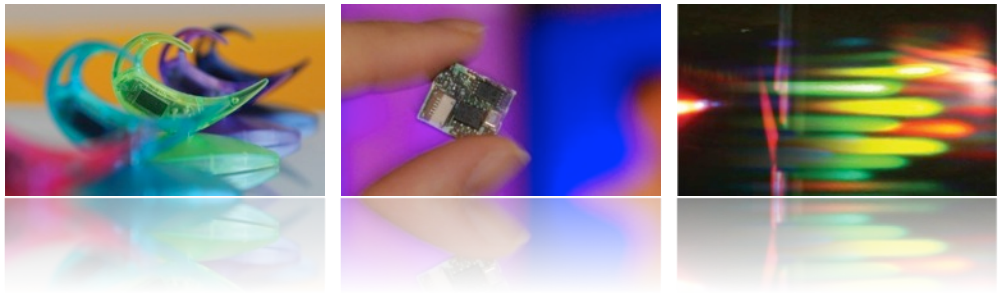
Innovation and global health

…and what it could mean for the NHS



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Agenda

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1. The role of innovation in healthcare
2. Types of innovation
3. Diffusing innovation
4. Some concluding thoughts
5. Group exercise

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Discovery v Idea v Innovation

Innovation is the act of developing an invention or idea into a product or service that creates value

(but what's value…?)

In what follows, I am usually talking about innovation that demonstrably changes *how* healthcare is delivered (service innovation) for the better

Innovation in healthcare has driven massive improvements in the human condition

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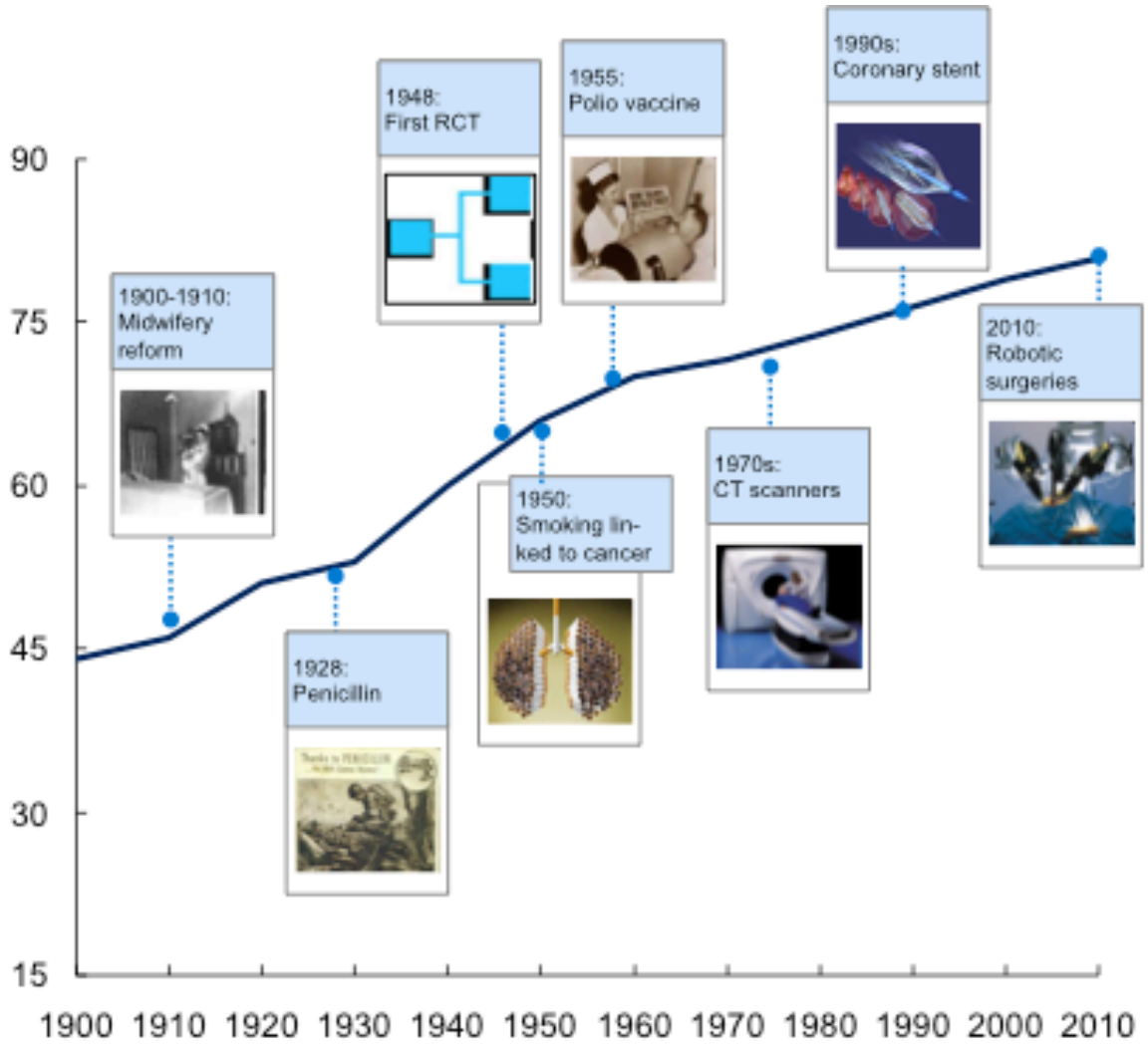

- **Average lifespan nearly doubled over the 20th century** – at the current rate of improvement, children born today could have an average life expectancy of 100 years.
- **Immunization and health programs** have decreased the global incidence of 5 major preventable diseases from 6.5 to 0.5 bn cases over 30 years.[1]

1 Diphtheria, polio, measles, pertussis, and tetanus

SOURCE: AJCN; OECD Health Data; University of Oregon "Mapping History"; WHO

There are new pressures on health systems which demand service innovation.

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Traditional models of healthcare delivery are poorly suited to modern diseases (i.e. NCDs)

In developing countries, extending access requires new ways of doing things

Financial resources are finite and, in most mature health systems, highly constrained

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This demand for increased innovation is global.

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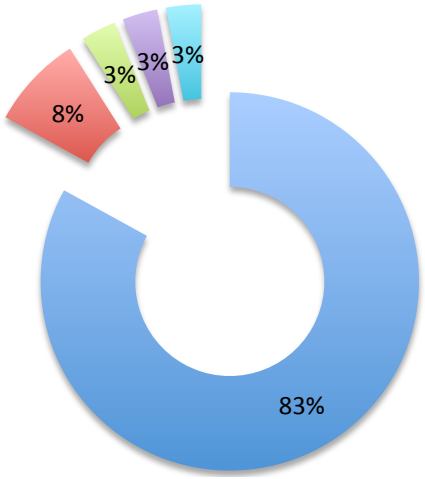
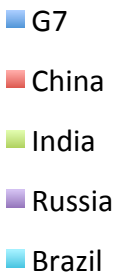
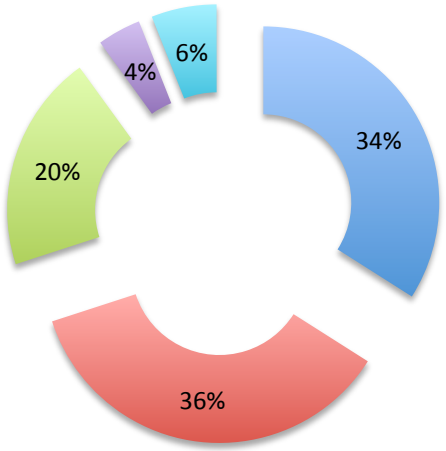
The first law of global health: as nations get richer, they demand more and better quality healthcare—and they are getting richer.

GDP in BRIC and G7 countries, 2006





Projected GDP in BRIC and G7 countries, 2050



To overcome labour shortages and extend access, emerging countries need new and more productive ways to deliver healthcare.

Developed countries need new ideas so they don't go broke!

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But there is a problem: innovation drives health expenditure.

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- "Technological" innovation defined widely to include new drugs, therapies and services– as well as kit
- Regarded by most scholars as the most important driver of expenditure

Unhealthy lifestyles

Aging populations

Maslow's hierarchy

Value-consciousness

Growing burden of disease

Higher patient expectations

DEMAND FOR HEALTH SERVICES

SUPPLY OF HEALTH SERVICES

Increasing capacity induces demand

unit cost of care

Suboptimal allocation of resources

Payment systems offer little financial incentive for patient to minimize cost

New therapies

Technological developments

Vested interests

Incentive systems

This dynamic has helped to drive expenditure at a rate consistently above economic growth.

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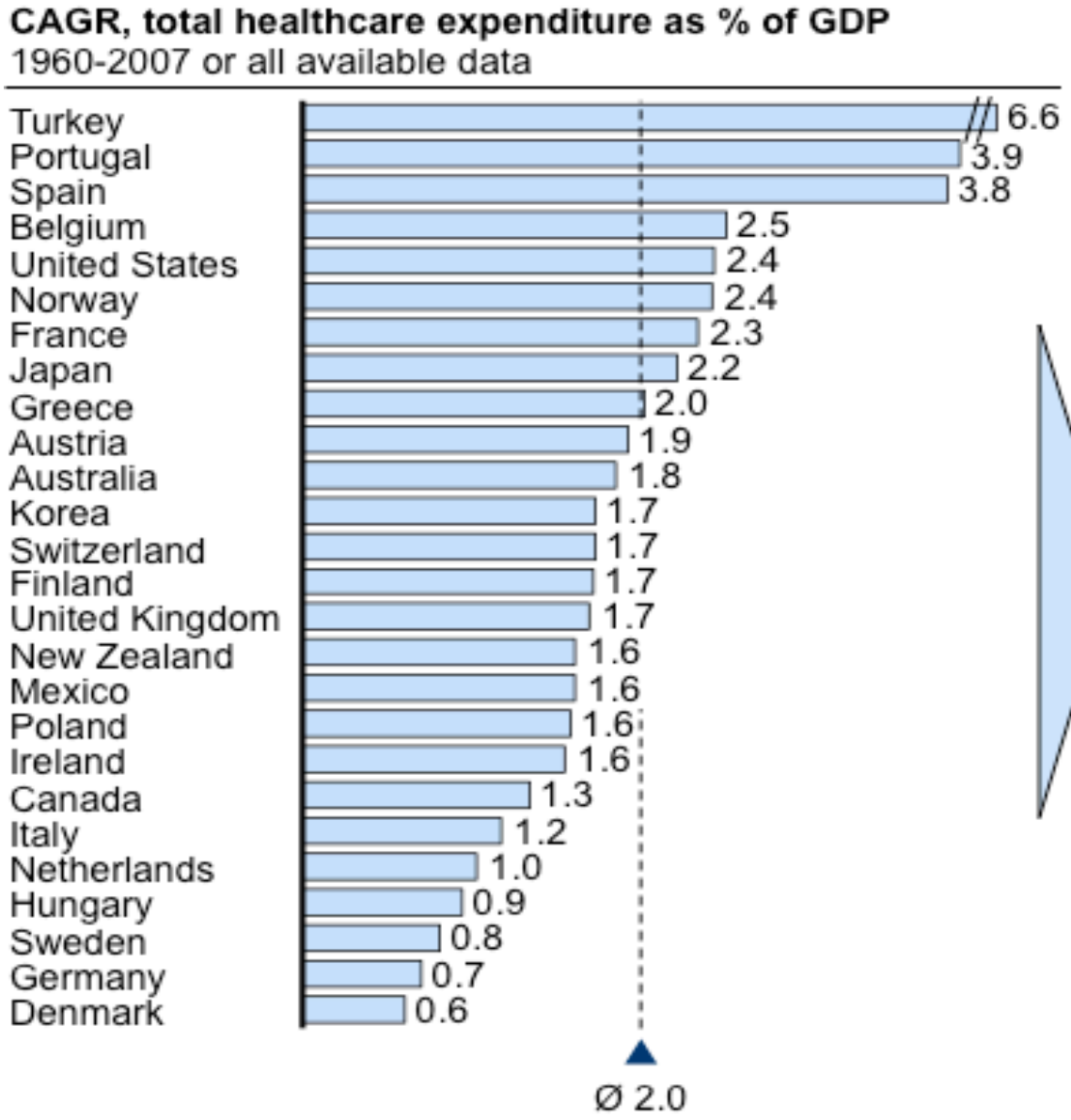

- On average, the weight of health expenditure over GDP has grown at 2% per year
- This trend continues today – the 2000-7 growth rate has remained at 2.0% on average in OECD countries
- Many cost reduction efforts have yielded results, but only temporarily; Ireland is the only country ever to keep health spending growth below GDP growth for 5 years in a row

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We can think of different spheres in which important innovations have emerged.

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- Biomedical, e.g. drugs, genetics
- Information technology, e.g. internet, mobile phones
- Medical devices, e.g. mammography, CT scanning
- Healthcare delivery, e.g. polyclinics, telemedicine
- Policy, e.g. reimbursement mechanisms, micro insurance
- Others you may think of…

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But thinkers have also identified different types that occur across sectors or spheres of activity.

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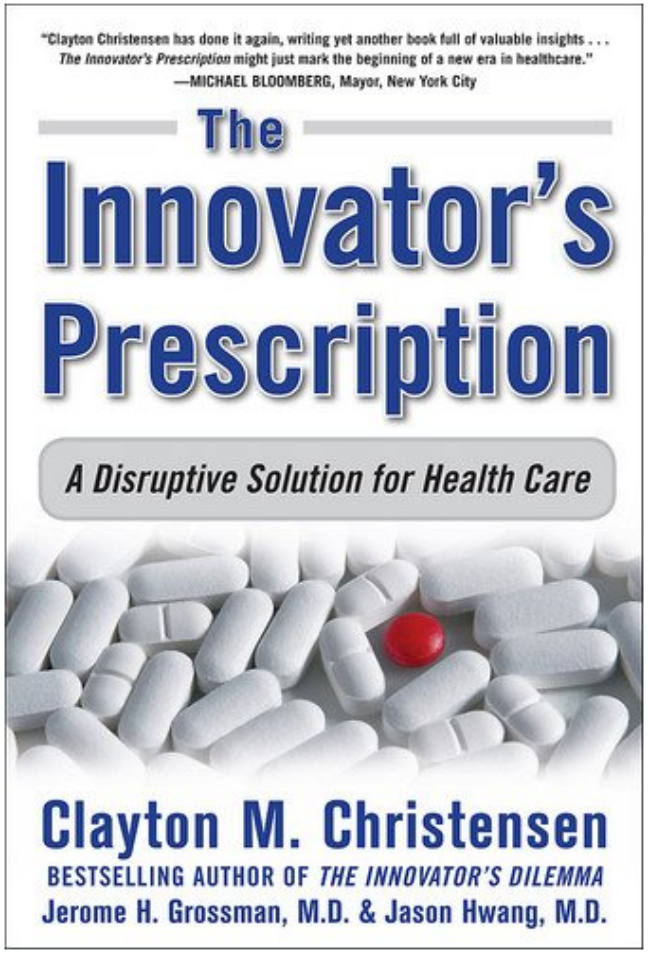

Christensen developed the very influential concept of "disruptive innovation".

The concept described innovations that may compromise performance, but in doing so significantly reduce price and/or improve access. They may create entirely new markets and disrupt previous ones.

Contrasted with "sustaining" innovations that improve the performance of existing technologies, products or processes.

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The related concept of “frugal innovation” has emerged more recently.

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Frugal innovations are specifically designed to meet the needs of low-income users and extend access to the excluded.

Mobisante’s portable ultrasound retails for $7k vs ca $50k for incumbents

eRanger ambulance: 19x cheaper and better response times

ARAVIND EYE CARE SYSTEM

Deliver about 60% of the eye surgeries but spend less than 1% the NHS does

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Other thinkers focus on business model innovation, emphasising that technology is usually insufficient.

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Aravind eye system keeps its costs so low by:

- Operating on multiple patients at the same time in the same room, with surgeons performing only the tasks they have to
- Make their own low-cost lenses and other ophthalmic consumables
- Highly standardised processes based on McDonalds!

Ribera Salud, a public-private partnership in Valencia:

- Paid an annual capitated fee for each member of the local population over 15 years; In return they provide comprehensive healthcare
- Creates incentives to prevent secondary care and keep people healthy
- Similar innovations in the US (Accountable Care Organizations)

Medicall Home, Mexico, shows how radical telemedicine could be:

- Provides basic care to over a million households for a flat monthly subscription fee of about $7
- Uses sophisticated triaging systems developed from Cleveland Clinic
- About two-thirds of calls need no further referral

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Much of the most exciting business model innovations come from the global south and east.

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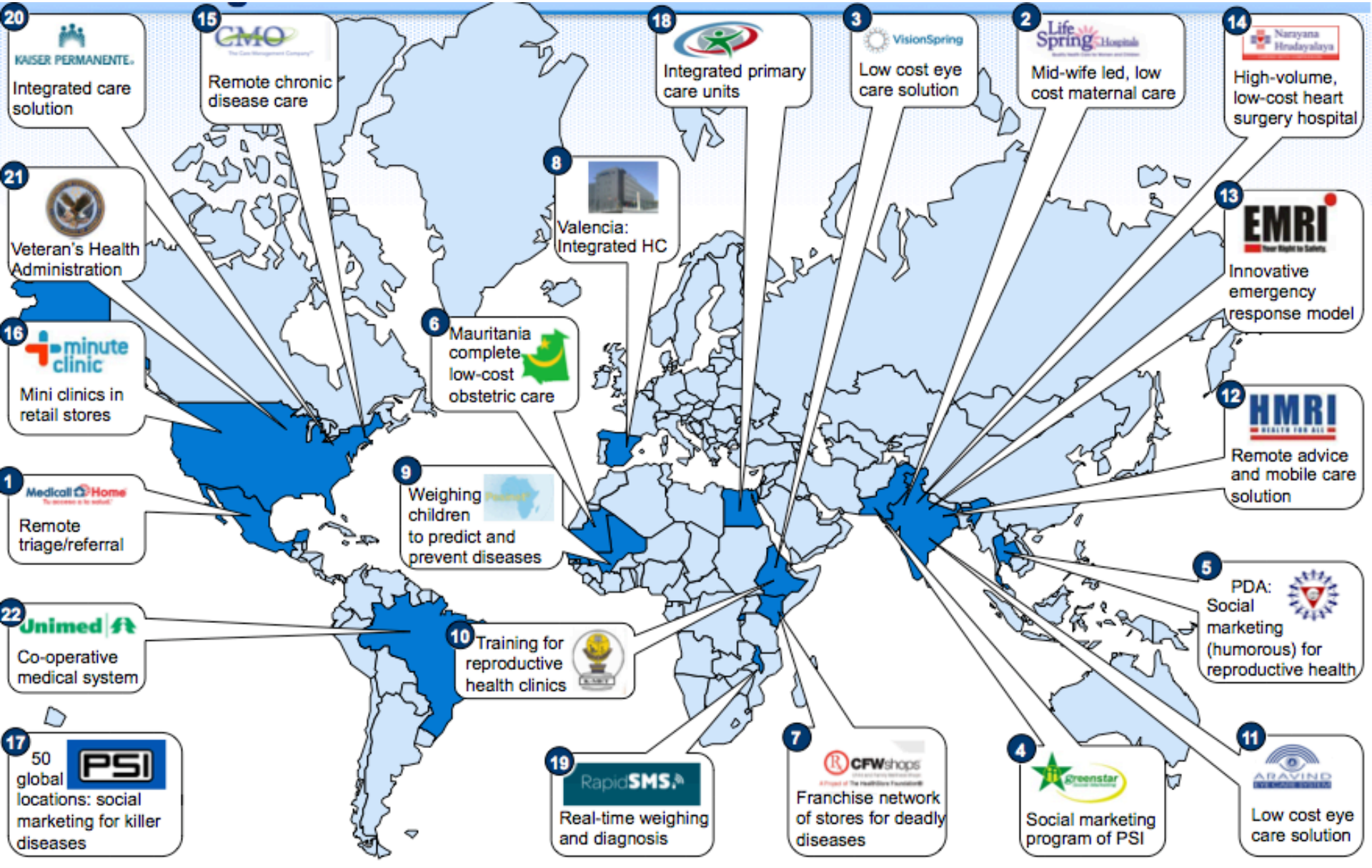

Christensen argues comingling business models has retarded progress in healthcare.

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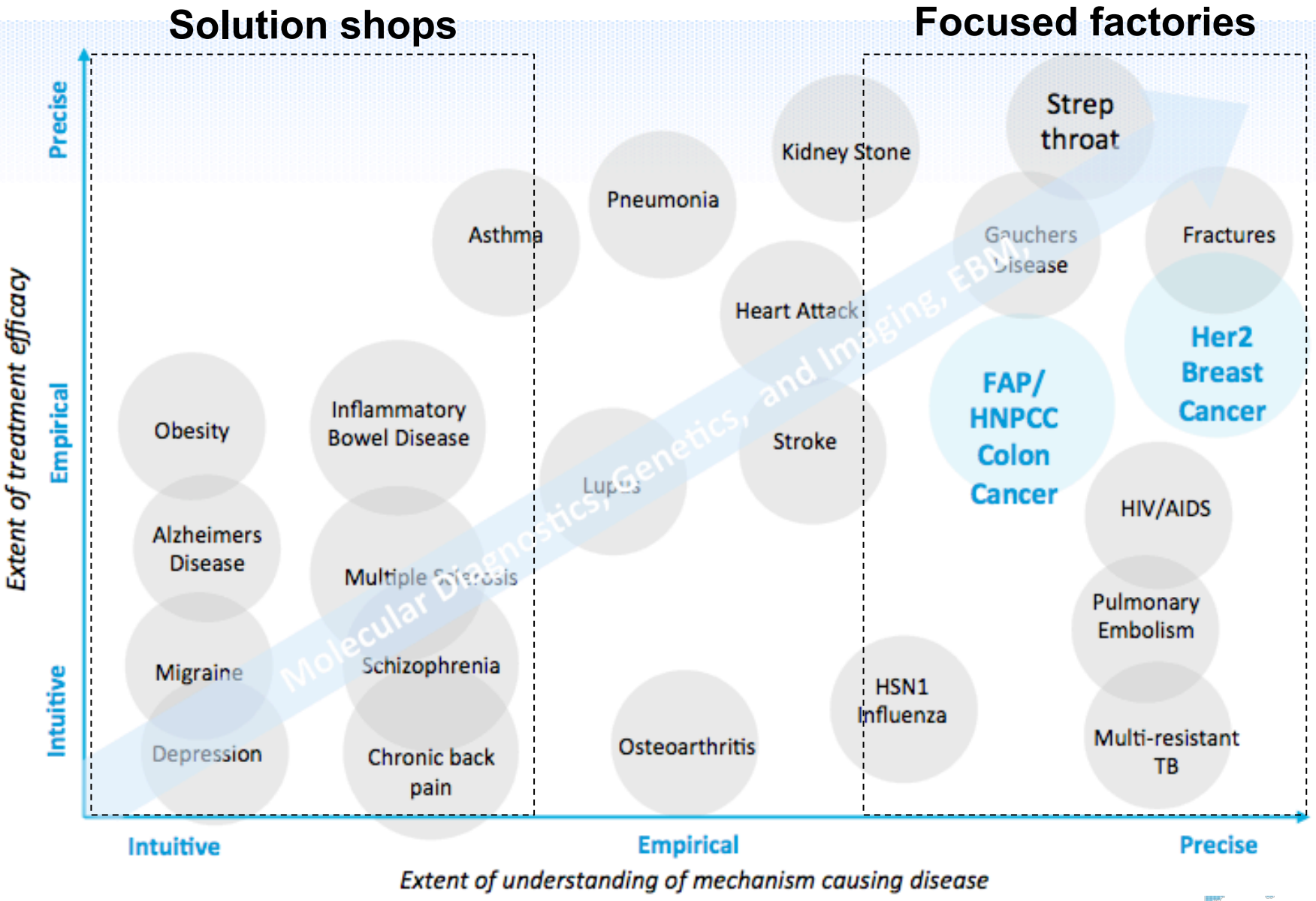

The importance of workforce innovation is increasingly recognised—both in developed and emerging systems.

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Driven by labour shortages, emerging and developing countries are developing workforces that with many fewer doctors

Tasks completed by doctors here are done by nurses, physician assistants and other paraprofessionals

Reform programmes in countries like Brazil and Turkey have increased access by wide deployment of lay health workers

These models all offer reduced dependence on scarce and expensive human resources

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Innovating is easy when compared to diffusing innovations throughout an organisation or system.

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An illustration: James Cook and the fight against scurvy

Adapted from Don Berwick, Disseminating Innovations in Healthcare, JAMA (2003)

- For centuries, scurvy was the main health threat for naval crews: 100 of 160 men on Vasco da Gama's voyage in 1497
- By the turn of the 17th century it was understood that three teaspoons of lemon juice a day could virtually eradicate scurvy
- Yet it took fully 264 years for the practice to be established on all British naval and trade ships
- James Cook, however, did not wait. Through a combination of leadership, innovation and science he implemented a new diet and hygiene regime on his three key voyages between 1768-80. He lost only 3 men on these voyages.

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In fact, all too often dubious innovations seem to spread whilst well grounded ones languish.

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Despite a lack of evidence about their effectiveness, some innovations may quickly spread

- New = good / doing something is better than doing nothing
- Technophilia
- Pressure from patients
- Intuitive appeal / face validity
- Profit-seeking

And others that do work may not be implemented

- Vested interests
- Inertia & conservatism
- Lack of glamour
- Investment requirements
- No champion with an interest in promotion

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At the system level, various barriers are cited to explain why innovation disseminates slowly.

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Studies have started to identify how organisations can increase rates of diffusion.

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Alter individuals' perceptions of innovations

- Illustrate benefits and reduce the psychological aversion to uncertainty
- Diffusions will diffuse most rapidly when they are compatible with beliefs, past history and current needs of individuals
- Simple innovations that can be locally adapted have the best chance
- Ensure innovations can be trialed first and results can be observed widely

Develop a permissive organisational culture

- Encourage and reward innovation—don't penalise failure
- Invest in innovation
- Lead by example

Deploy those who are predisposed to adopting innovation

- Identify and resource innovators and early adopters who can lead the rest
- Make early adopters highly visible and facilitate face-to-face interaction with the early majority (papers and guidelines don't work)
- Identify those who can credibly communicate the message ('trusted messengers')

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Rogers' 'diffusion curve'.

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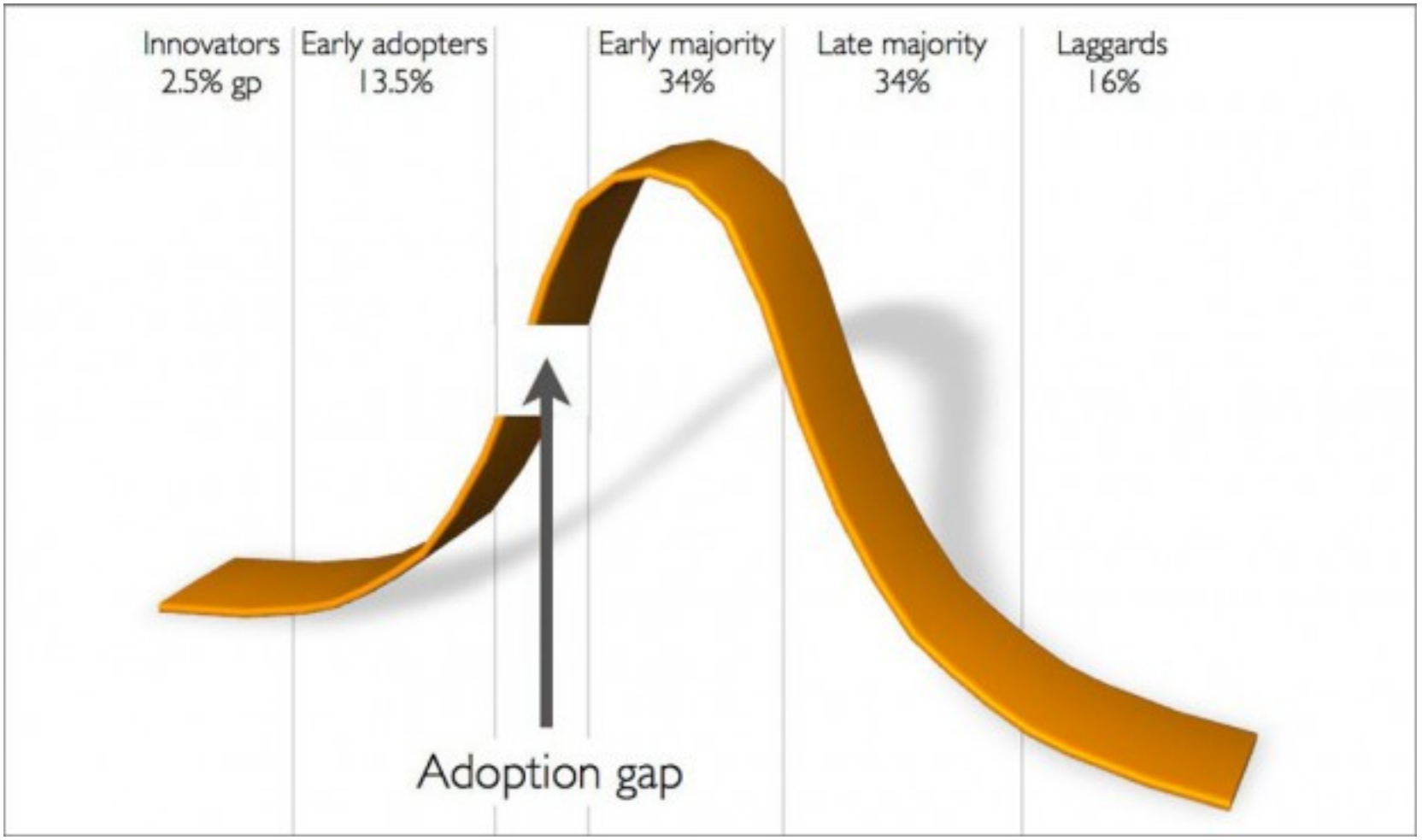

Adapted from Everett Rogers, *Diffusion of Innovations* (1995).

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At the system level, diffusion strategies have been identified although evidence on what works is thin.

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Professionals and peers	• Disruption of existing practice and threats to vested interests slow diffusion • Therefore, professionals may be enlisted to sell and demonstrate changes • However, professional groups tend to be conservative
Quasi-markets	• The combination of competition, choice of provider and payments that follow the patient can drive innovation • Evidence suggests providers will compete on quality if prices are fixed • Those that fall behind lose patients and money
New entrants	• May or may not be introduced with quasi-markets • Evidence from other industries suggests the most powerful innovations tend to come from new players—sometimes drawn from different sectors (e.g. IT) • Others must adopt innovation to avoid being left behind

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Systemic diffusion strategies cont'd.

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Governments	• Have a key role in removing barriers and facilitating diffusion, e.g. regulation, R&D investment etc. • They have some tools to incentivise uptake; for instance, using conditional payments like CQIN • But efforts to compel innovation have a sorry record
Patients and consumers	• Consumer voice can help diffuse and scale innovations • They may be increasingly important with self-management and direct-to-consumer diagnostics and therapies expected to gain ground • Systems typically poor at channeling patient voice
Transparency	• Publishing quality and other data about systems, providers, teams and individual clinicians can expose those who have adopted effective innovation • Incentives for diffusion may best be created by coupling with effective channels for patient voice and choice

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Some implications of all this.

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- Maintaining universal, high quality healthcare in developed countries will require significant innovation
- Developing countries cannot achieve their access objectives on a sustainable basis without finding new and better ways to deliver services
- These shared challenges may inaugurate a truly global flow of innovation, with some of the best increasingly coming from the global south and east
- This innovation will be less dependent on expensive and highly-skilled clinicians and less focused on “Rolls Royce” solutions
- Facilitating and supporting innovation is important; understanding how to diffuse it is also critical. Clinical leaders and policymakers should not expect good ideas automatically to win out

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Group exercise.

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The Secretary of State for Health (me!) is worried about the long-term sustainability of the NHS.

He is convinced that the NHS must change to survive, but is unsure in what way or how to do so.

He has asked his clinical advisors (you!) to provide him with recommendations that form the basis of a programme for action.

You should prepare a short presentation (max 8 minutes), working together with your colleagues. You will present your findings to the rest of us.

Consider:

- What types of innovation should be encouraged and how
- The most appropriate diffusion strategy
- The opportunities and risks of this strategy
- What concrete actions the Secretary of State should take

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