

**“Money could buy you comfort and  
luxury, but it couldn’t buy you  
the only thing in the world of real value,  
which was health.  
It couldn’t buy you a cure”**

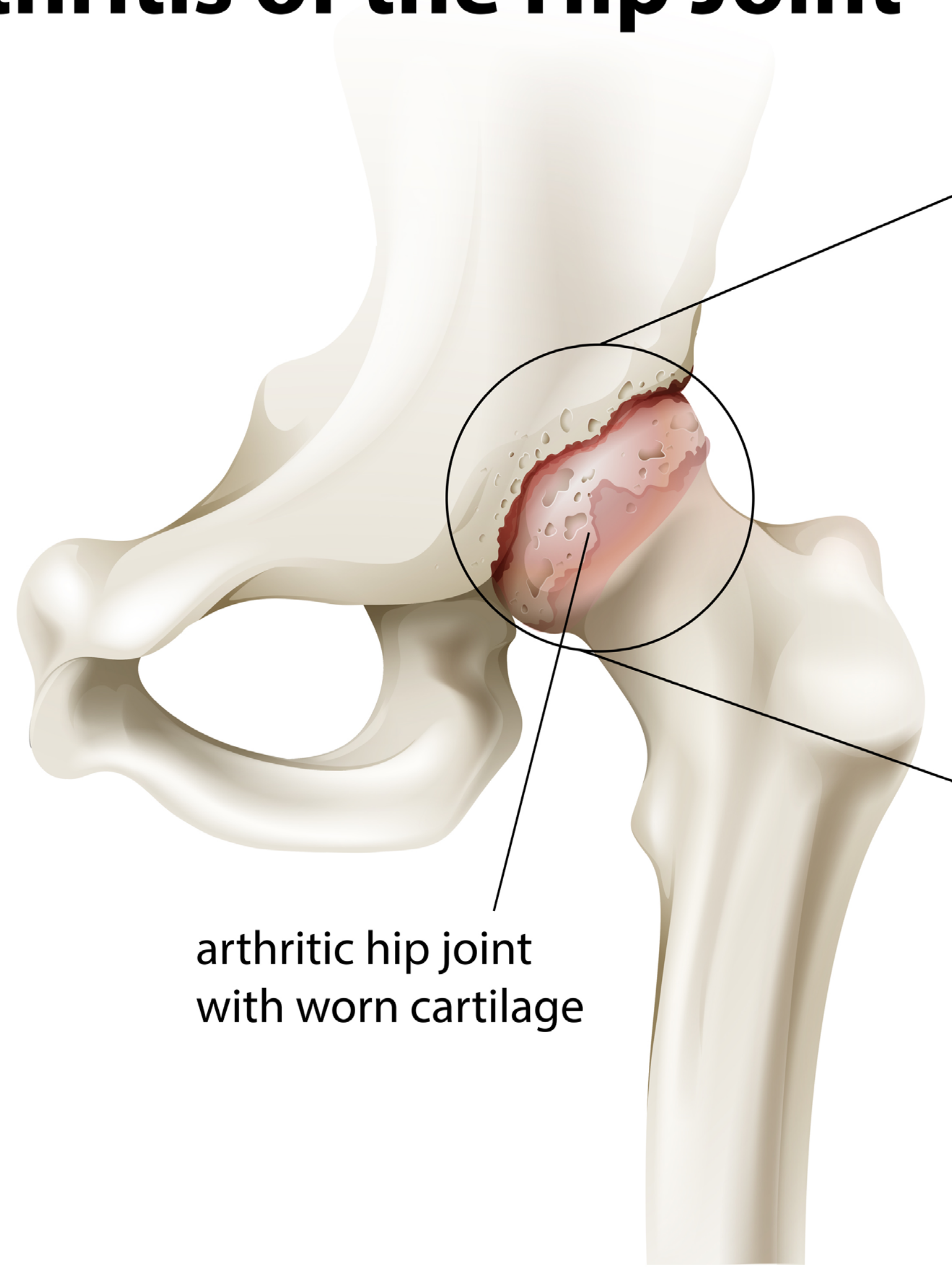
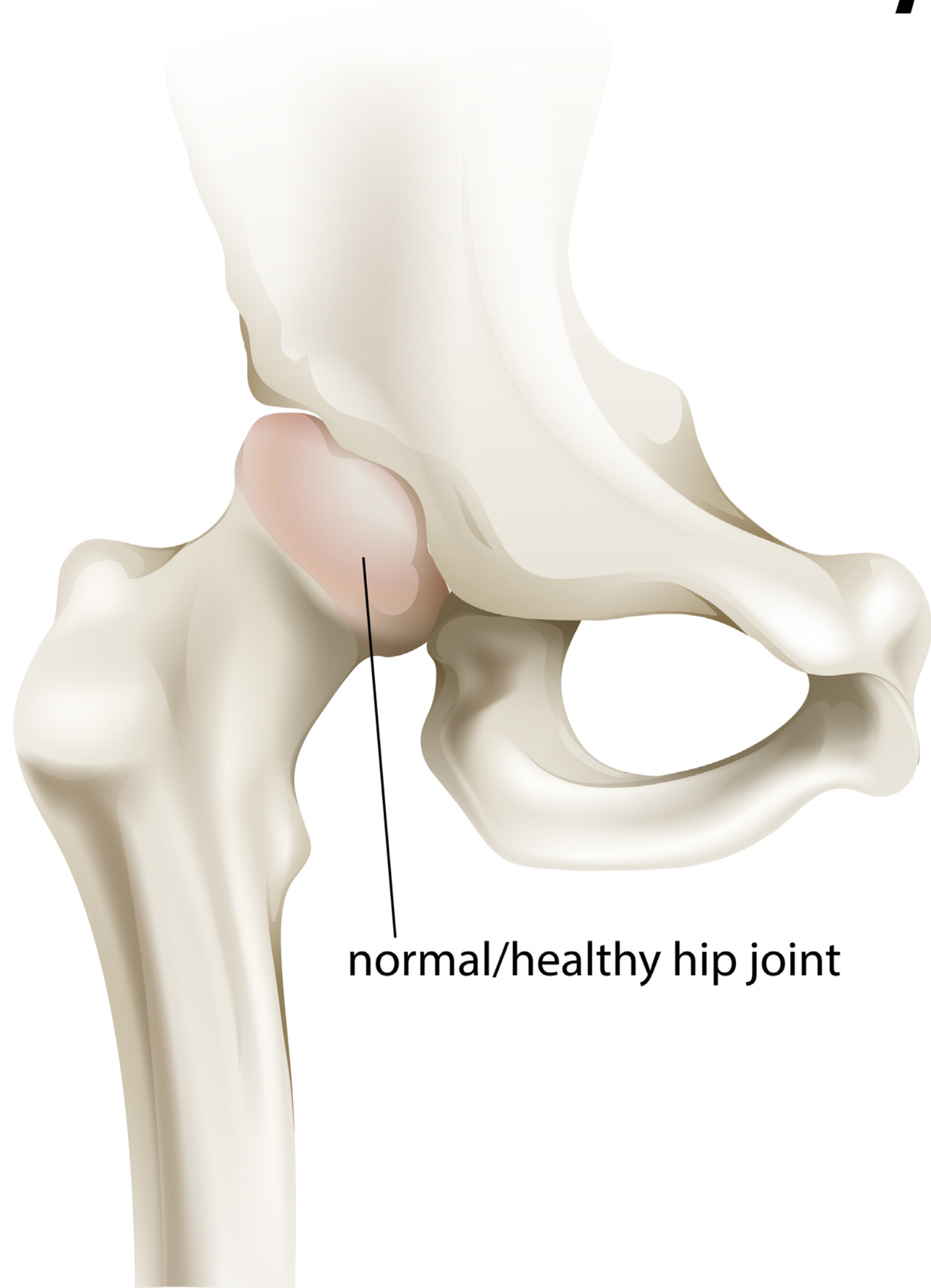
**Peter James, 2013**

# What is Value in Healthcare?

**Martin Elliott**

37th Gresham Professor of Physic

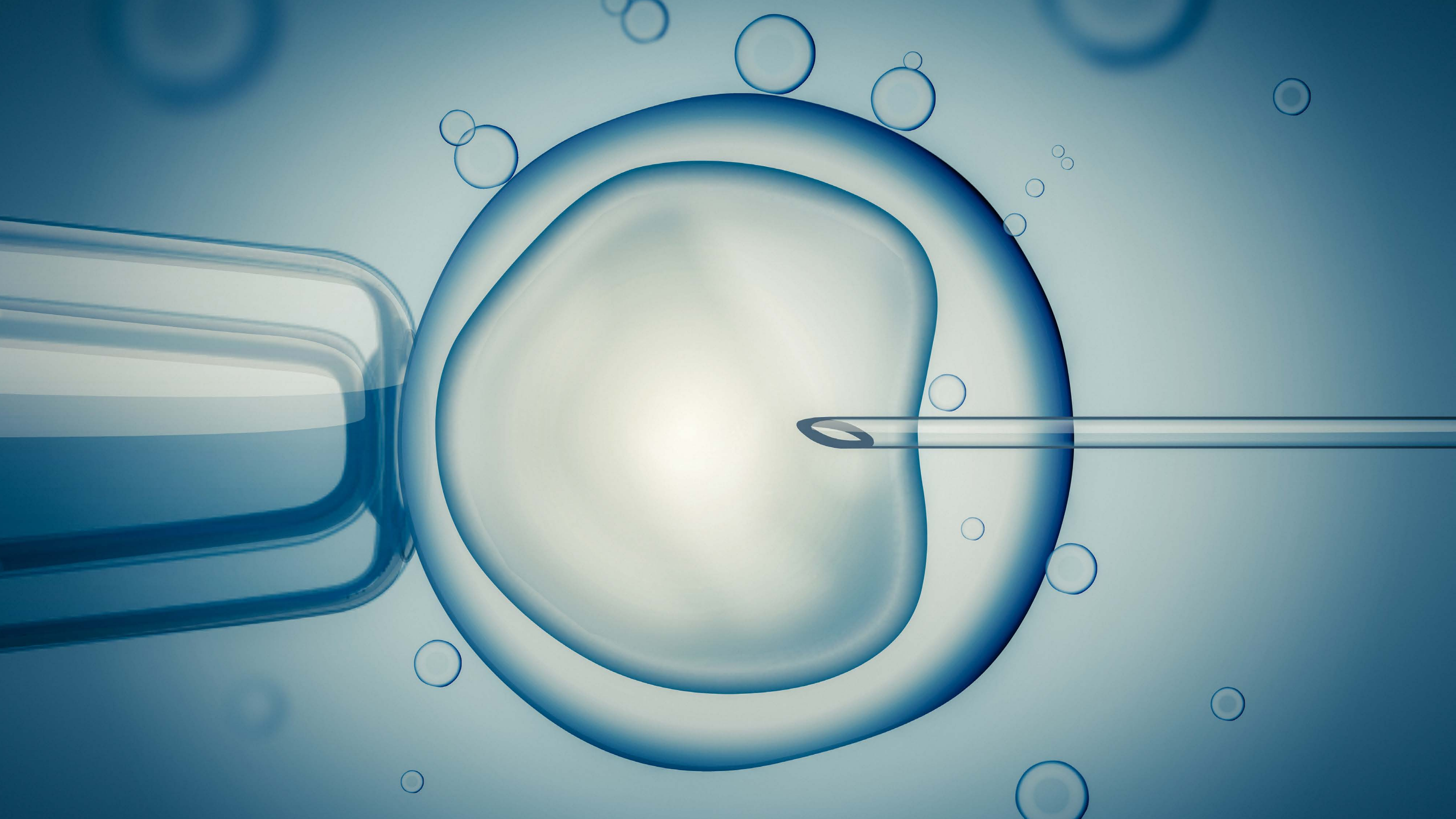
# Arthritis of the Hip Joint



















# Pain-level rationing of hip and knee surgery due to cash crisis, admits NHS

Official says financial pressure to blame for West Midlands plan to offer transplants only to those who cannot sleep or do daily tasks

**Matthew Weaver and Press Association**

Friday 27 January 2017 09.09 GMT

Three clinical commissioning groups (CCGs) in the West Midlands have proposed reducing the number of people who qualify for hip replacements by 12%, and knee replacements by 19%. To qualify under the proposed rules, patients would need to have such severe levels of pain that they could not sleep or carry out daily tasks.



## HEALTH SERVICE

# HEARTACHE Desperate couples face 'cruel and unethical' IVF rationing as only two per cent of NHS providers offer full treatment, says report

Women under 40 who cannot reproduce are entitled to three rounds of IVF, but report reveals some treatment centres are unable to offer any at all

# 'Gamechanging' cancer drug rejected for use on NHS

Nivolumab deemed too expensive for the benefits but cancer specialists urge NHS and manufacturers to reach compromise



# Value in Healthcare

- **range of global health expenditure**
- **does that expenditure produce value for money?**
- **how we choose which treatments to employ**
- **how we estimate 'value' to a patient or society**
- **how we estimate cost**
- **what we need to do to get value for money**

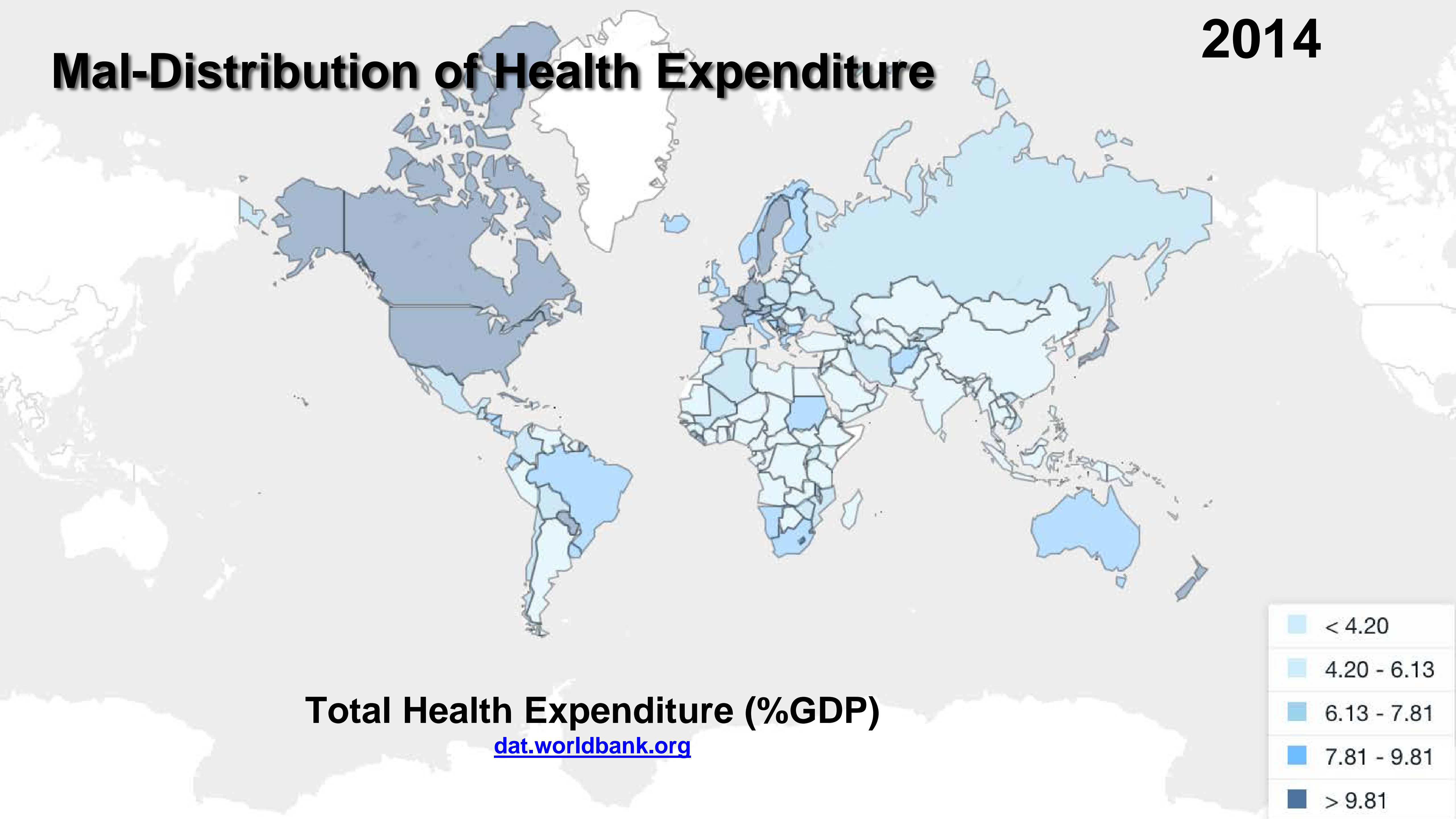
**Bank of England**

**Expenditure**



2014

# Mal-Distribution of Health Expenditure



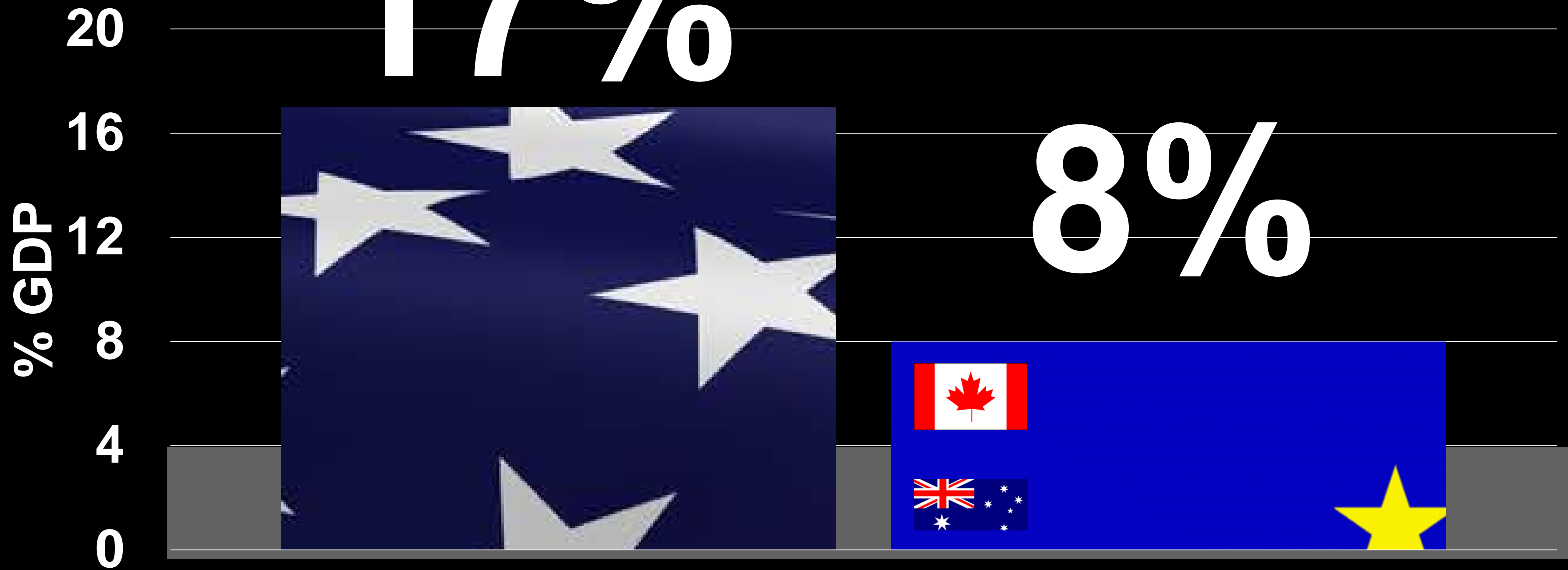
**Total Health Expenditure (%GDP)**

[dat.worldbank.org](http://dat.worldbank.org)

# Health Expenditure as % GDP (2014)

17%

8%





# Health Expenditure \$ *per capita* (2014)



**Do Americans live twice as long? Are they twice as healthy?**

**most money, least value?**

- **highest infant mortality**
- **highest %age of adults with >2 chronic conditions**
- **highest mortality in conditions amenable to healthcare**
- **shortest life expectancy in people aged 60y**

# UK Public Spending as % of GDP

% GDP

48

45

42

39

36

33

30

2008

2009

2010

2011

2012

2013

2014

2015

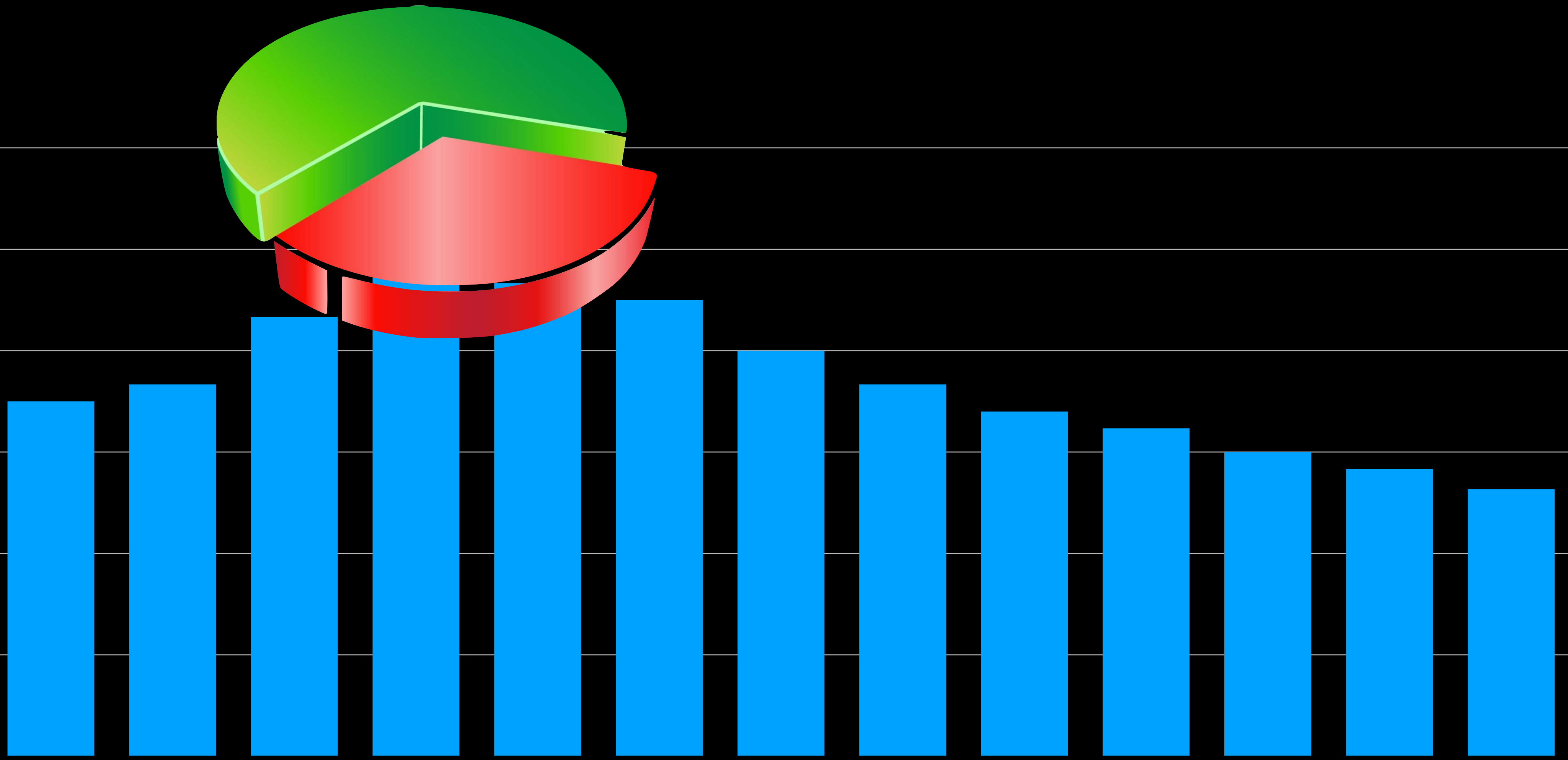
2016

2017

2018

2019

2020



**more demand**  
**changing structures**  
**organisational complexity**

**£22 billion**

**older, sicker, poorer population**

**restricted hours contracts**

**staff shortages**



TheKingsFund>

Ideas that change  
health care

# Better value in the NHS

The role of changes in  
clinical practice

Authors

Hugh Alderwick

Ruth Robertson

John Appleby

Phoebe Dunn

David Maguire

July 2015



## Chris Ham



**action is required at all levels of the NHS**

***“to maximise the value of every pound spent  
on patient care”.***

**He concluded that there should be ‘particular  
emphasis’ on clinical practice.**

# wasteful clinical care

ineffective

inappropriate

poorly cost effective

**How  
do we choose  
which treatment  
to offer?**





# Evidence-Based Medicine

base treatment decisions  
on the 'best available' evidence

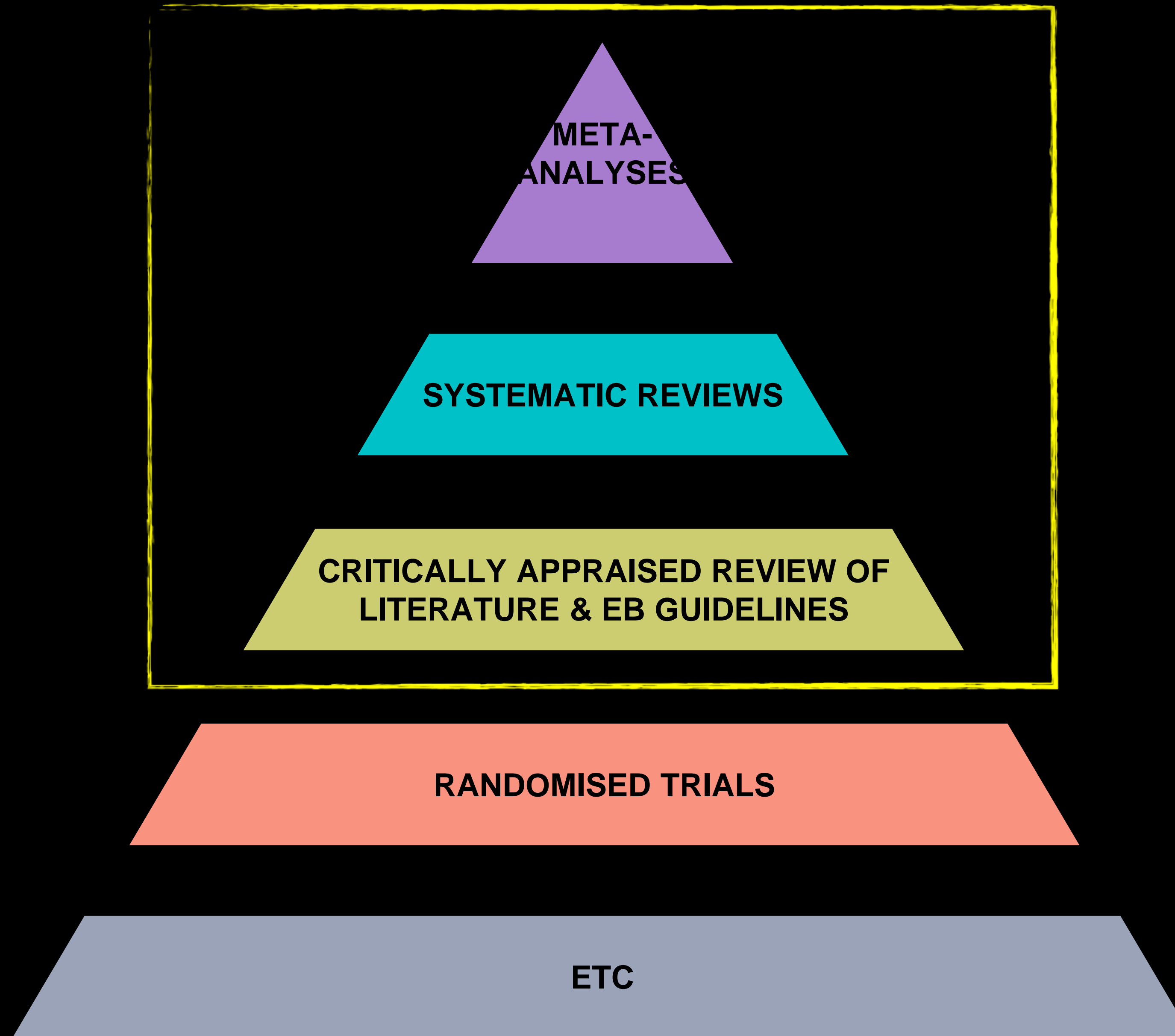
assumes

access, veracity, implementability,  
permission

# Hierarchical Levels of Evidence

Level of Evidence	Interventional Study
Level I	<b>Randomised Clinical Trial</b> with a low (<5%) chance of a false +ve outcome and a low (<20%) chance of a false negative outcome
Level II	<b>Randomised Clinical Trial</b> with a high (>5%) chance of a false +ve outcome and a high (>20%) chance of a false negative outcome
Level III	<b>Un-controlled, un-randomised clinical trial</b> treatment v no treatment without randomisation
Level IV	<b>Intervention in a series of patients with no comparison group</b>
Level IV	<b>Interventional case report</b>

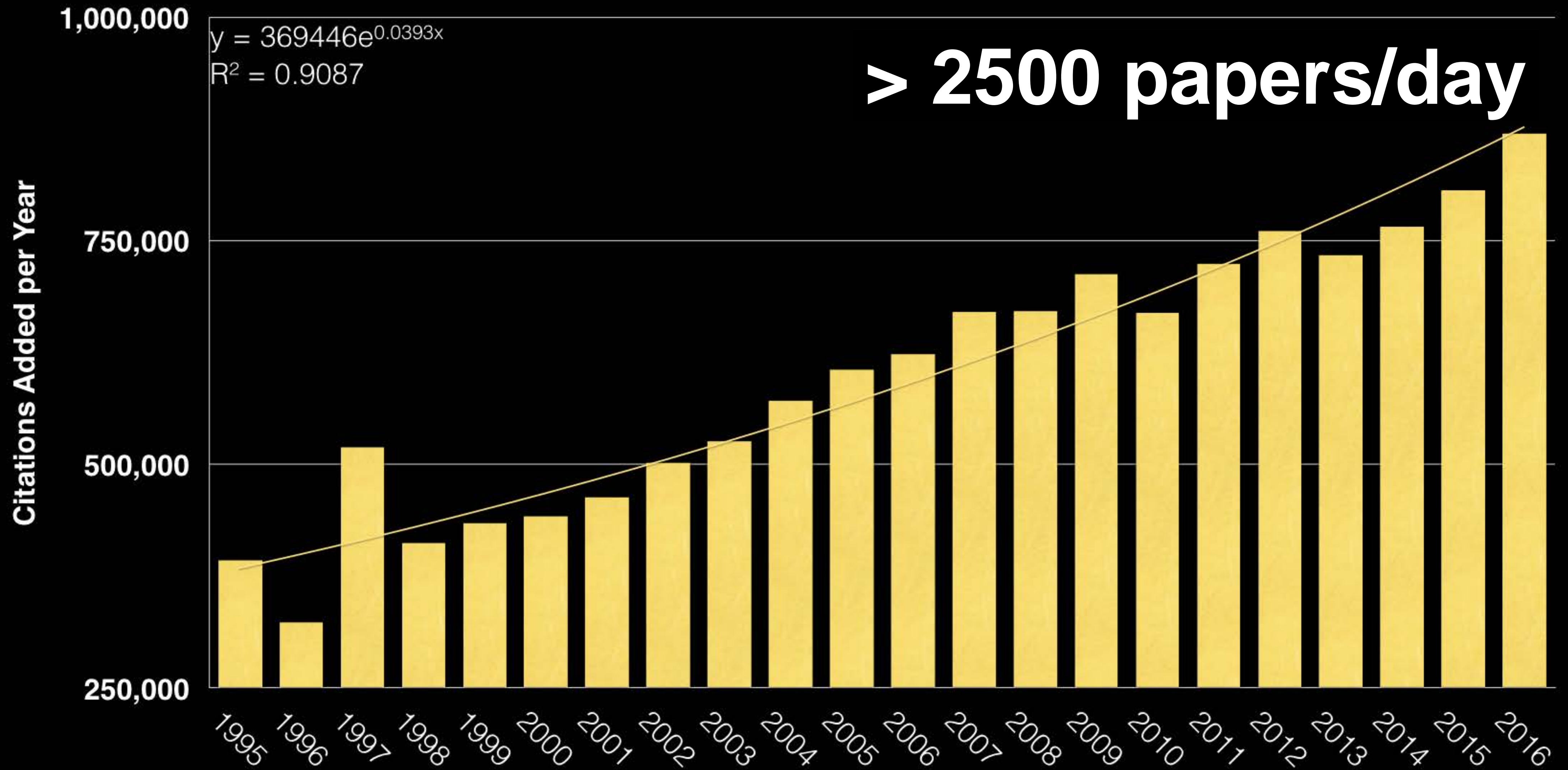
**Critical  
Appraisal**



**Insight**



# annual citation additions to Medline



at present, the  
sum-total of  
medical  
information  
doubles  
every 3.5 years



Estimated doubling time  
of medical knowledge

Densen et al, 2011



# Value-Based Medicine

the 'best available' evidence combined  
with **patient-perceived quality of life**

**related to resources used**



# VBM; Cost-Utility Analysis

$$\text{Value (to the patient)} = \frac{\text{Outcome over the course of life}}{\text{Cost over the course of life}}$$

the VALUE equation

**good quality care  
delivers value**

# IoM Attributes of Quality of Care

<b>Category</b>	<b>Benefit</b>
<b>Safety</b>	<b>patients should not be harmed by their care</b>
<b>Patient-Centred</b>	<b>care should be based in individual needs</b>
<b>Timely</b>	<b>waits and delays should be minimised</b>
<b>Effective</b>	<b>care should be evidence-based</b>
<b>Efficient</b>	<b>waste should be reduced to a minimum</b>
<b>Equitable</b>	<b>care should be equal for all people</b>

$$\begin{aligned} \text{Value (to the patient)} &= \frac{\text{Quality}}{\text{Cost}} \\ &= \frac{\text{(Outcomes + Experience)}}{\text{(Direct + Indirect Costs)}} \end{aligned}$$



# Sounds Simple?

**“There are few industries in which purchasers are unable to measure the value of what they purchase; historically, healthcare has been the major one”**

Brown, Brown & Sharma 2005

# IoM Attributes of Quality of Care

<b>Category</b>	<b>Benefit</b>
<b>Safety</b>	<b>patients should not be harmed by their care</b>
<b>Patient-Centred</b>	<b>care should be based in individual needs</b>
<b>Timely</b>	<b>waits and delays should be minimised</b>
<b>Effective</b>	<b>care should be evidence-based</b>
<b>Efficient</b>	<b>waste should be reduced to a minimum</b>
<b>Equitable</b>	<b>care should be equal for all people</b>





**measuring  
effectiveness**



**Mortality**

**Length of Stay**

**Organ Function Measures**

**Infection Rates**

**Re-admission Rates**

**Exercise Tolerance**

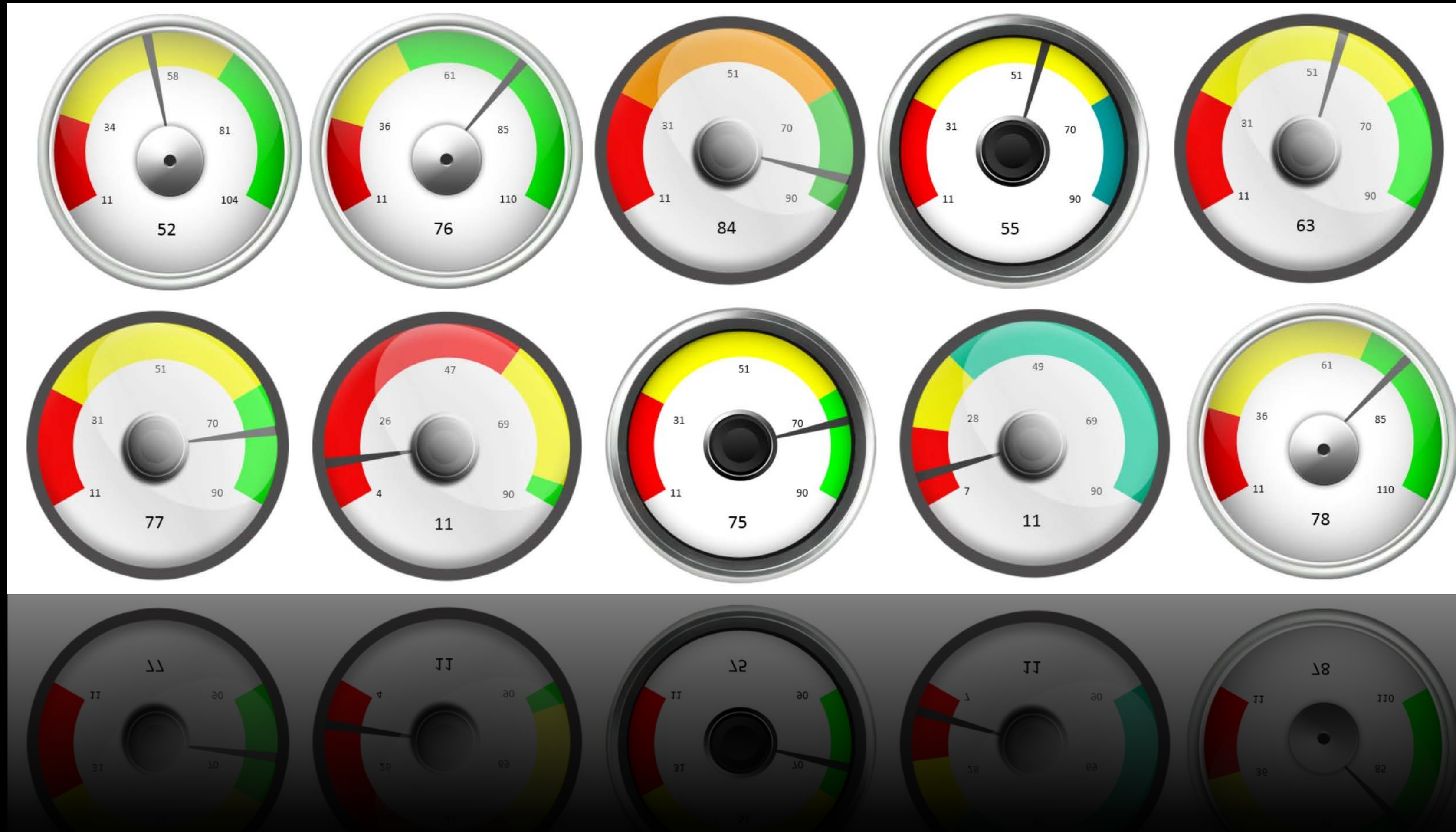
**Bleeding Rates**

**Return to Theatre**

**Range of Movement**



# How to Measure Quality of Life





# Measures of Quality of Life

## Instruments

**Function-  
Based**

**measure the patient's functional capability  
related to a health state or disease**

**Preference-  
Based**

**require that the patient decides his or her  
preference of a particular health state**

**Generic**

**measure aspects of quality of life across all  
specialties**

# Function-Based Instruments



# The American College of Rheumatology

## Classification of Global Functional Status in Rheumatoid Arthritis

**Class**

**Description**

**Class I**

**Able to perform all usual activities of daily living (self-care, work, school, leisure)**

**Class II**

**As above, but with limited leisure activities**

**Class III**

**As above, but also limited ability to work or go to school**

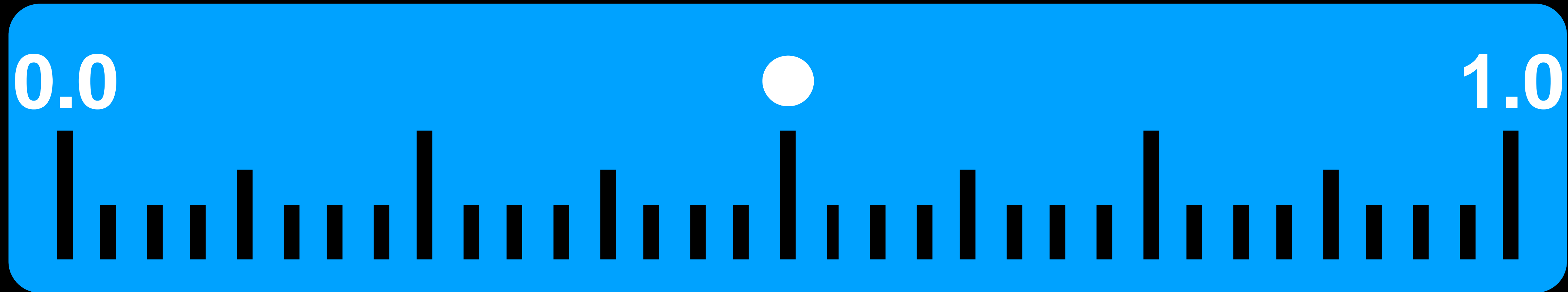
**Class IV**

**Limited in all aspects of life**

# Preference-Based Instruments

- **Utility Analyses**
  - Standard Gamble
  - Willingness to Pay
  - Time-Trade Off
- **Rating Scales**
- **Multi-attribute Utility Analyses**

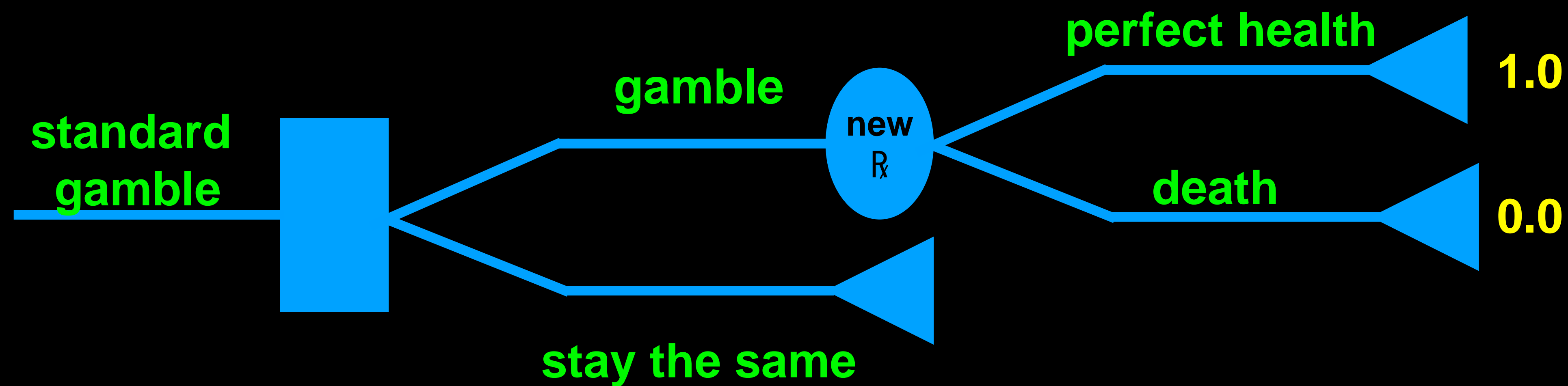
# Utility Scale Convention



state  
of  
death

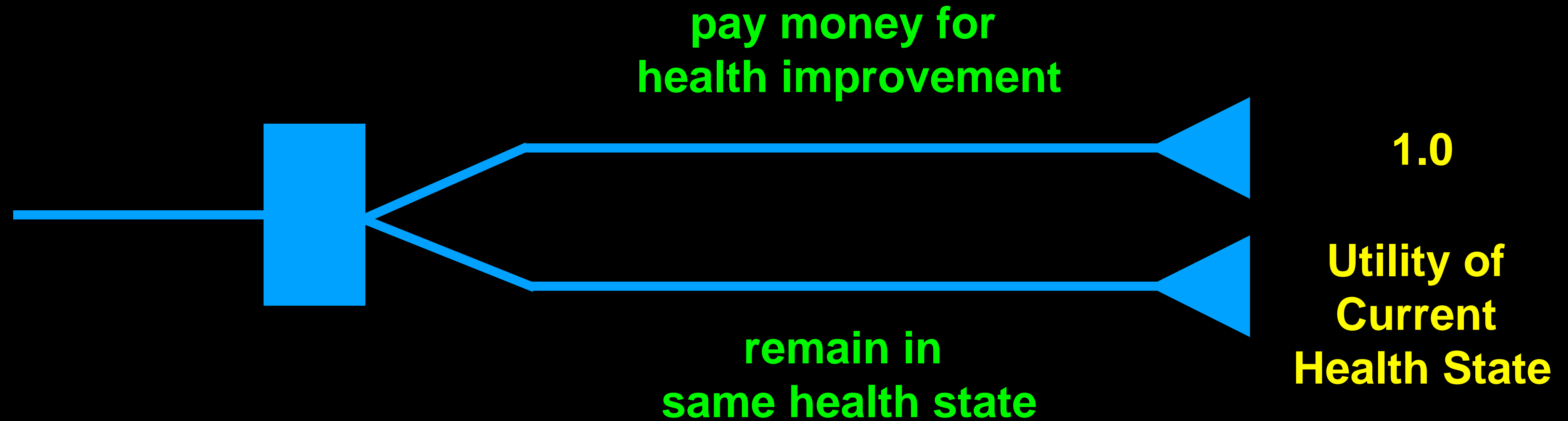
perfect  
health

# Standard Gamble Utility Analysis



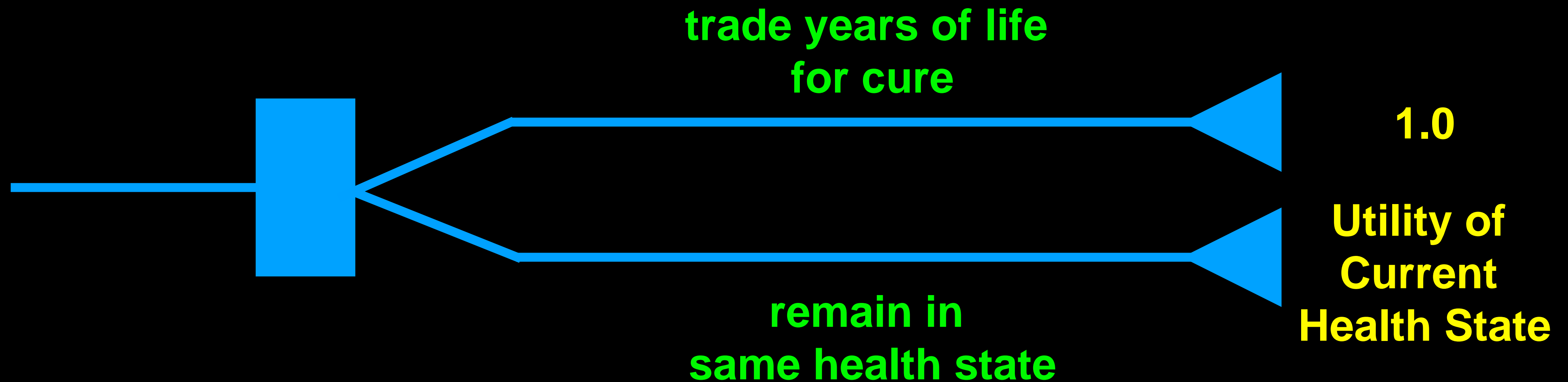


# Willingness-to-Pay Utility Analysis



If someone was willing to pay  
**20% of their income** to get rid of diabetes  
this would equate to  
**a utility value of  $1.0 - 0.2 = 0.8$**

# Time-Tradeoff Utility Analysis



**The patient expects to live for 20 more years but is willing to trade 3 of those years to be free of diabetes**

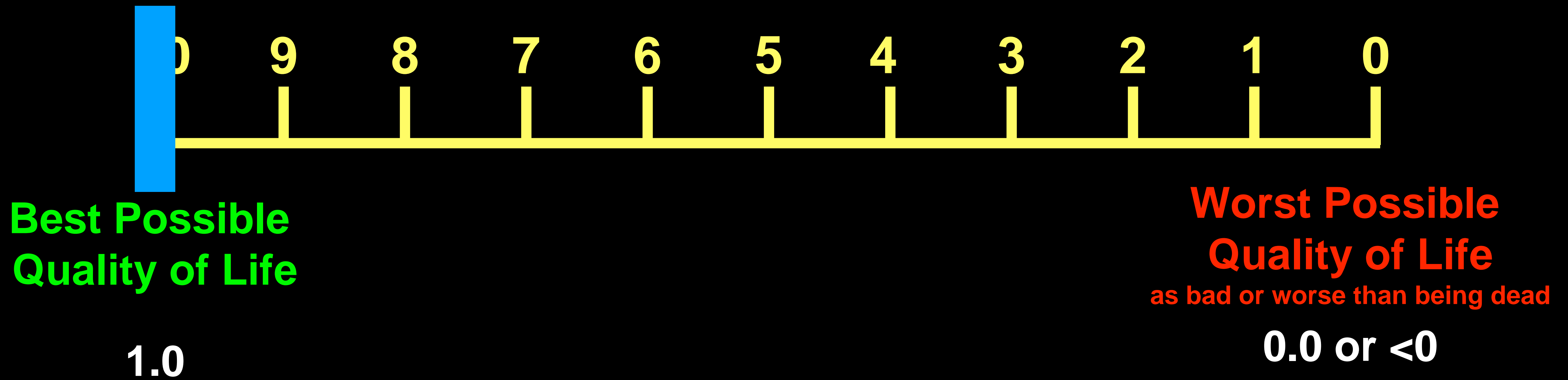
**The calculated utility value is  $1.0 - (3/20) = 0.85$**

**If she were to trade off 7 years, the utility would be 0.65**

# Rating Scales

# Overall, how would you rate your quality of life?

Circle one number on the scale below





# Multi-Attribute Instruments

# The 5 Dimension of the EuroQoL 5-D

Dimension	Degree of Difficulty		
1. Mobility	No Problem	Some Problems	Confined to Bed
2. Self-Care	No Problem	Some Problems	Unable to Wash or Dress
3. Usual Activity	No Problem	Some Problems	Unable to Carry Out
4. Pain/Discomfort	None	Moderate	Severe
5. Anxiety/Depression	None	Moderate	Severe

# The 5 Dimension of the EuroQoL 5-D

Dimension	Degree of Difficulty		
1. Mobility	No Problem	- 0.12	Confined to Bed
2. Self-			Unable to Dress
3. Usua			to Carry Out
4. Pain/Discomfort	None	- 0.15	Severe
5. Anxiety/Depression	None	Moderate	Severe

$$1.0 - (0.12 + 0.15) = 0.73$$

**1.0 Utility Value**

**QALY**

**Quality-Adjusted Life Year**

$$\text{YRS OF LIFE} \times \text{UTILITY VALUE} = \text{\#QALYs}$$



state  
of  
death

perfect  
health



Assume a person lives for  
**one year in perfect health**

$$1 \text{ year of life} \times \text{utility value of } 1.0 = 1 \text{ QALY}$$

Assume a person lives for only  
6 months in perfect health

$$0.5 \text{ year of life} \times \text{utility value of } 1.0 = 0.5 \text{ QALY}$$

Assume a person lives for  
1 year but only 0.5 perfect health

$$1 \text{ year of life} \times \text{utility value of } 0.5 = 0.5 \text{ QALY}$$

Utility Value

1.0  
0.9  
0.8  
0.7  
0.6  
0.5  
0.4  
0.3  
0.2  
0.1  
0

**Drug A + 0.6 QALYs**

**Current Care  
3y x 0.7 utility  
=  
2.1 QALYs**

**Drug B  
+ 1.4 QALYs**

**A**

**B**

1

2

3

4

5

**Get the most QALYs for  
the available resources**

weighting

equity > efficiency

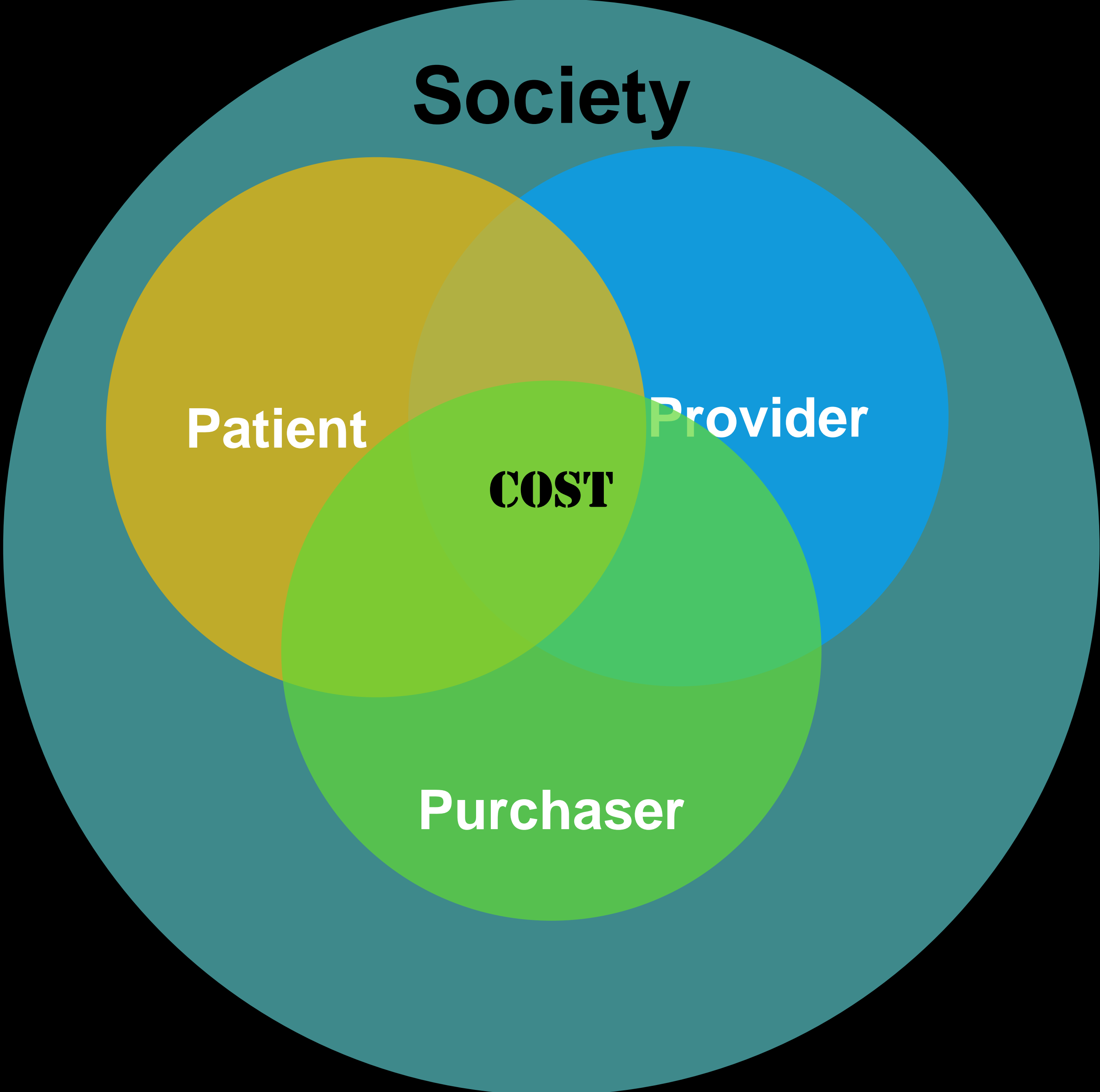
<https://www.nice.org.uk>



A close-up photograph of a person's hand holding a black magnifying glass. The lens of the magnifying glass is focused on the word "COSTS", which is written in a bold, white, sans-serif font. The background is a blurred, blue-toned image of what appears to be a computer keyboard, suggesting a business or financial context. The lighting is soft, highlighting the texture of the hand and the frame of the magnifying glass.

**COSTS**

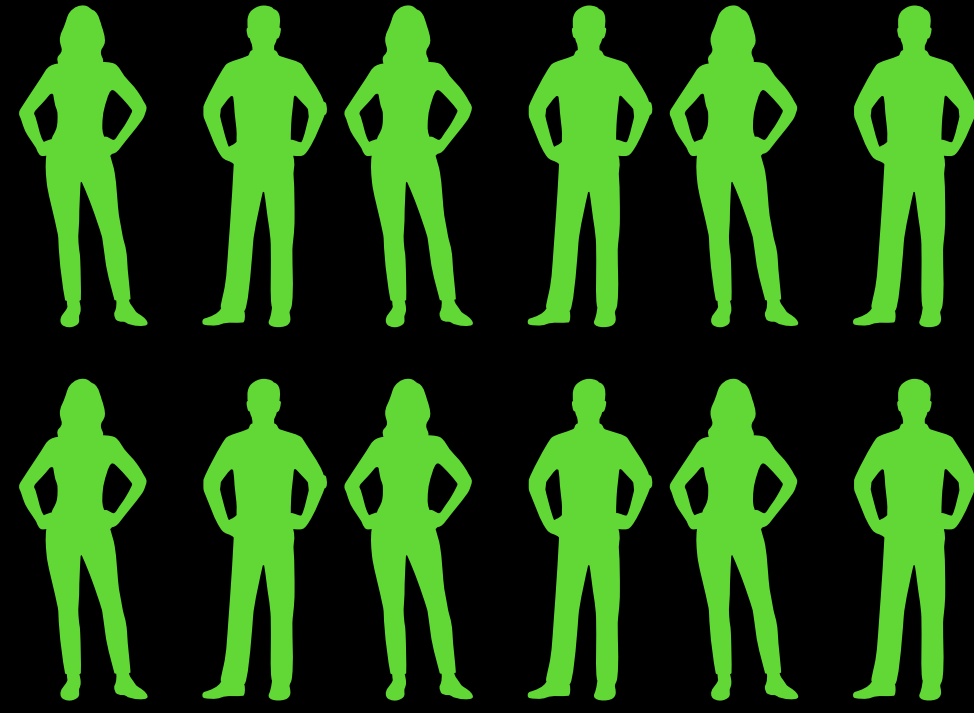




# *NHS* 1948

**central budgetary control, little local costing**

# Cost Drivers



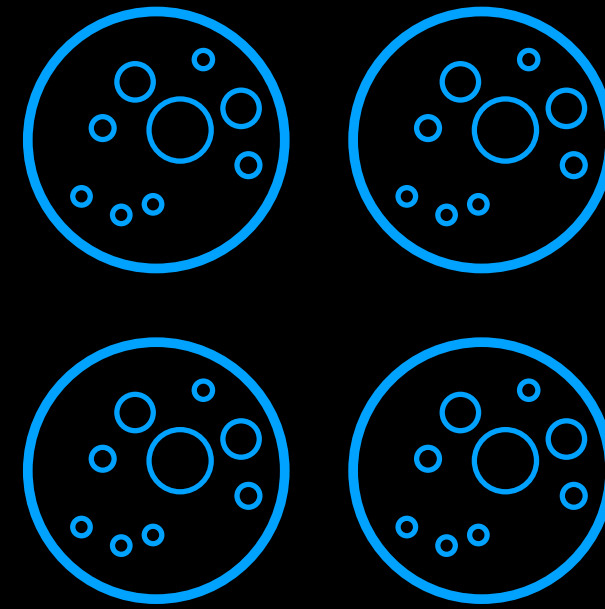
**Staff**

**Facilities**



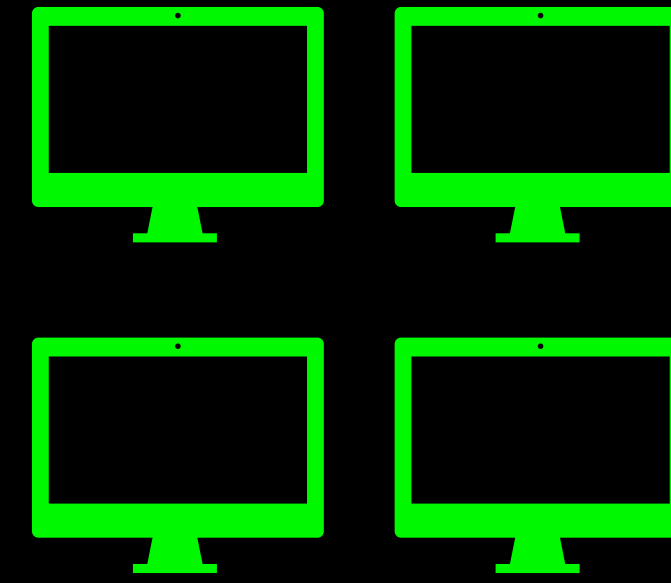
**Drugs**

**Scale**



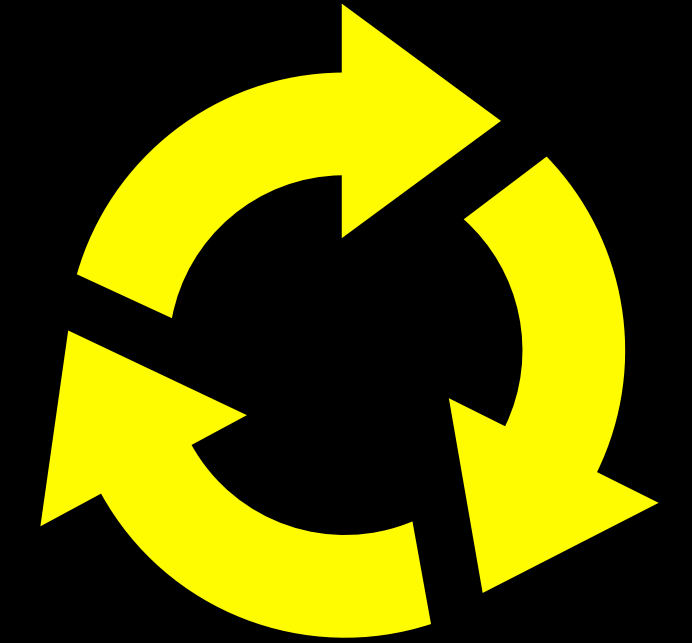
**Complications**

**Location**



**Technology**

**Waste**



**Process**

**Education**

# deciding WHAT to cost

Event or  
Procedure

Treatment  
episode or group  
of similar  
episodes

- define the resources needed to deliver the service
- measure the ACTUAL utilisation of those resources
- attach MONETARY VALUE to the resource use







**1989-90  
NHS Reforms**

**An Internal Market  
The Purchaser:Provider Split**



# Incremental Costs

**those costs consumed or saved secondary to a healthcare intervention.  
Without the intervention, they would not have occurred.**

## Direct Costs

**Healthcare**  
the value of all goods and services consumed in the provision of an intervention or dealing with its side effects or other consequences

**Non-Healthcare**  
e.g.  
childcare costs  
caregiver costs  
transportation costs  
social service costs

## Indirect Costs

those associated with loss or gain of productivity after intervention  
e.g.  
lost time and wages  
lost tax revenue  
decreased productivity  
disability payments

## Future Costs

those costs predicted in the future, but still related to the intervention  
e.g.  
rejection costs in transplantation  
late bowel obstruction  
prosthesis failure

# Health Resource Groups

**HRGs**

standard groupings of **clinically similar treatments** which use **common levels of healthcare resource.**



# Payment by Results

**PbR**

nationally determined **currencies** (eg HRG) and **tariffs** (based on reference costs)

# In-Hospital Costs

## Data Sources

- general ledger
- EHR
- payroll
- labs
- supplies
- imaging
- orders
- pharmacy
- facilities
- etc

**Extract  
the  
Data**

**Tabulate  
Data  
in  
Data Warehouse**

**Integrate,  
analyse  
and  
present  
the data  
in  
usable  
form**

**Board  
Reports**





**Patient Level Costing  
(PLICS)**



**Service Line Reporting  
(SLR)**

**Activity Based Costing  
(ABC)**



**“Rarely does the letter **S**  
make such a difference to meaning  
as in the difference  
between **value** and **values**”**

**Professor Matthew Cripps**







**DOWNING  
STREET SW1**  
CITY OF WESTMINSTER

**WHITEHALL  
SW1**  
CITY OF WESTMINSTER



# Improving health and social care through evidence-based guidance

## Cost-saving guidance

We've identified NICE guidance that could generate cost savings.

**variation**



# Unwarranted Variation

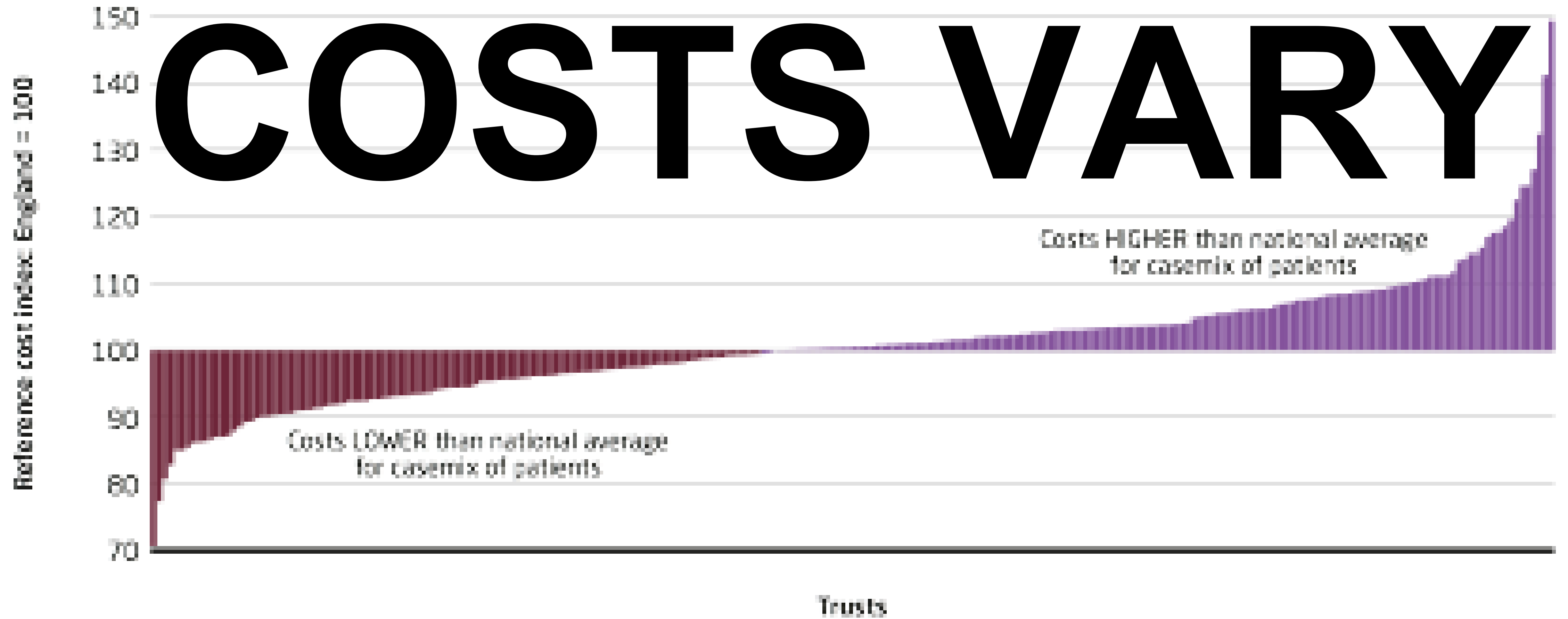
- **Underuse** of high value interventions
- **Overuse**, or high rates of lower value activity







**Figure 3** Reference cost index: English hospitals, 2013/14



Source: Department of Health 2014

**highest quality care**

**at the**

**lowest possible cost**

**Too much  
management?**

health care is an **information economy**

**data**

**integrated across the NHS**



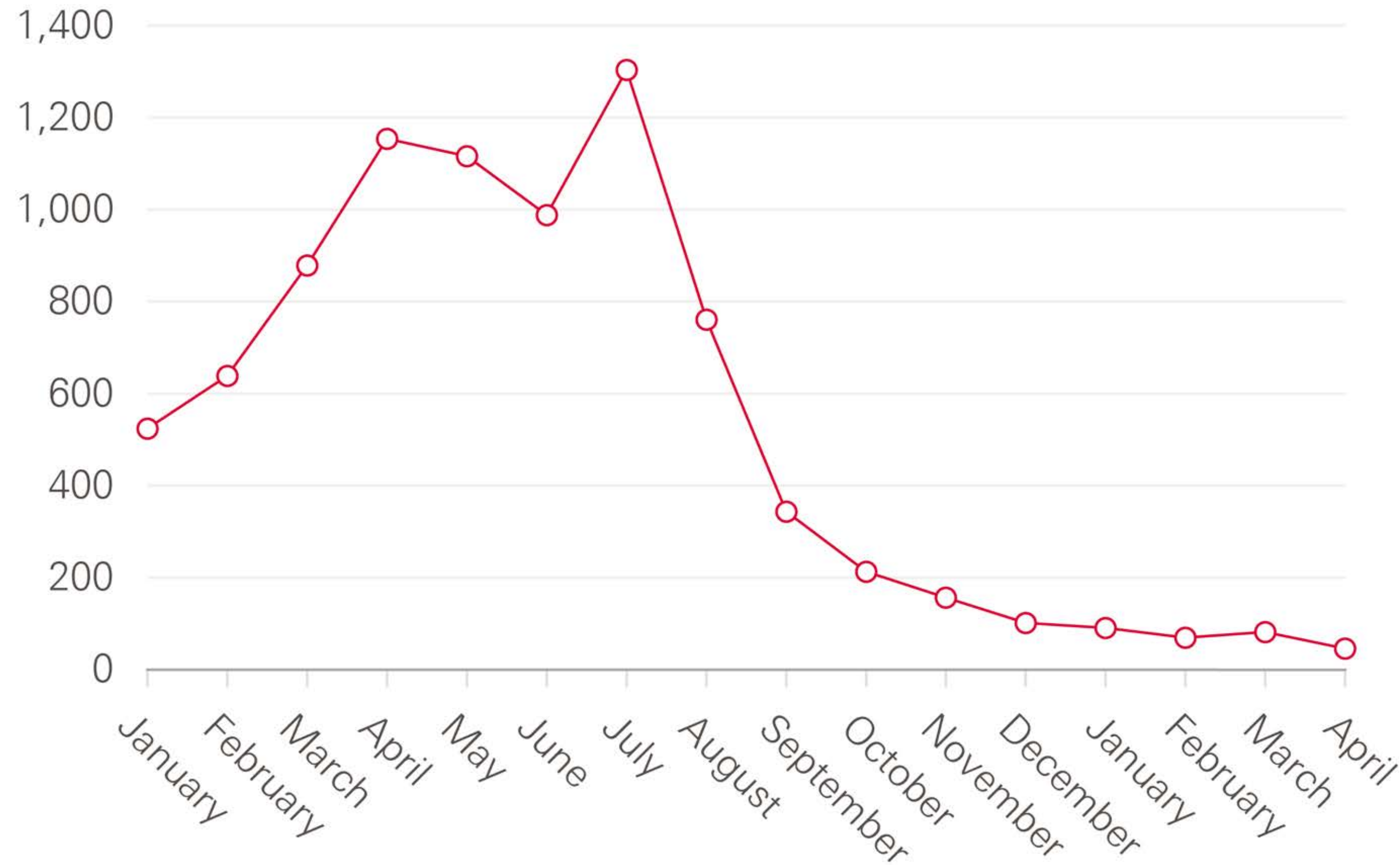


<http://www.wpreuss.com/Churchill/Churchill.html>

**Thank You**

# New nurse registrants from the EU

Total number of EU nurse registrants in the UK, January 2016–April 2017





# Share of new nurse registrations

Annual % of new nurse registrants in the UK from UK and international sources, 1990/91–2016/17

