



HEALTH TECHNOLOGY ASSESSMENT



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Why HTA?

The purpose of HTA is:

- **To spend money wisely**

Aim of session

- **To understand basic concepts in health technology assessment**
- **To know that assessment provides information not a decision: committee judgement is still needed**
- **To understand common terms used in HTA reports:**
 - Different types of cost
 - Health states
 - Disease models

HTA: three questions

- **Does it work?**
- **How well does it work?**
- **What does it cost?**

Does it work? – Quantity

- **Prolongs life**

‘increases survival by 5 years’

Does it work? - quality

- **Improves quality of life**

‘I didn’t need to use a wheelchair’

- **Reduction in disability**
- **Health state**

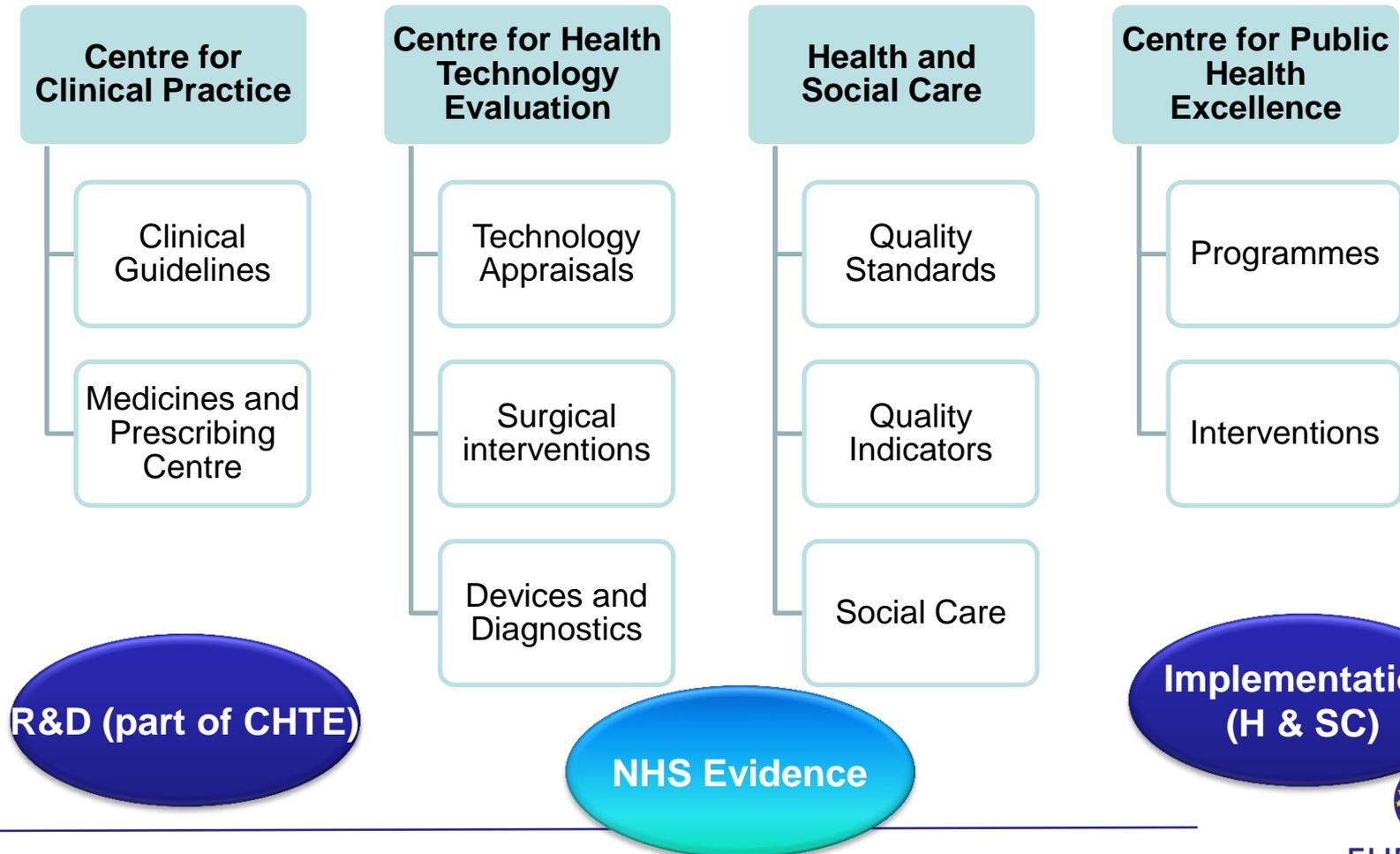
NICE

National Institute for Clinical Excellence

- Premier HTA institution in England
- All material available at www.nice.nhs.uk
- But NICE has several outputs – not all HTA

Structure and activities

Patient and public involvement (H & SC)

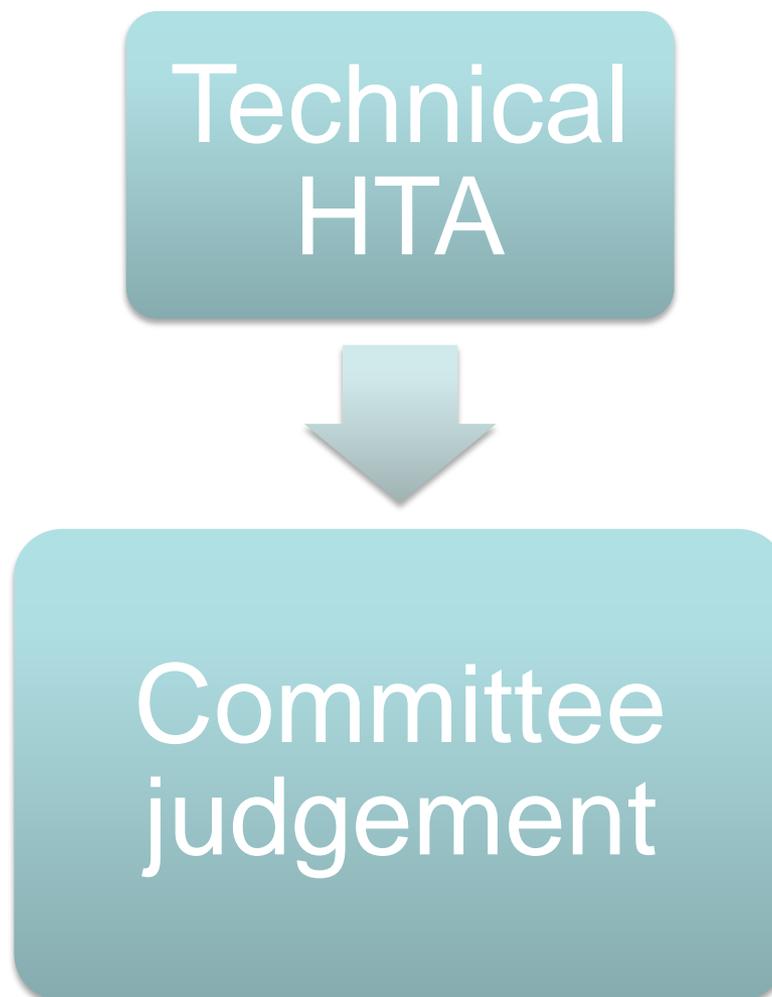


- **> 300 appraisals since March 2000**
- **Main stream includes orphan drugs**
- **Separate stream for ultra orphan**
- **Usually 'no' if >£30 000 per QALY**

NOT ALL DRUGS!

- **Medicines**
- **Devices (e.g. hearing aids or inhalers)**
- **Tests used to identify diseases**
- **Procedures (e.g. removal of wisdom teeth)**
- **Health promotion (e.g. ways of helping people with diabetes manage their condition).**

HTA = information, not decision



Assessment / appraisal

specialised services

Health
technology
assessment



Committee appraisal

- **Lay input**
- **‘Social value’**
- **End of life**

The next slide shows special considerations used by the committee in several assessments

Table 1

Application of 'special circumstances' in the appraisal of some products with incremental cost-effectiveness above £30 000 per quality adjusted life year

Topic	ICER ('000s)	Severity	End of life*	Stakeholder persuasion	Significant innovation	Disadvantaged population	Children
Riluzole (motor neurone disease)	38–42	✓	✓	✓			
Trastuzumab (advanced breast cancer)	37.5	✓			✓		
Imatinib (chronic myeloid leukaemia)	36–65	✓			✓		
Imatinib (gastrointestinal stromal tumour)		✓	✓		✓		
Pemetrexed (malignant mesothelioma)	34.5	✓	✓			✓	
Ranizumab (age-related macular degeneration)	>>30			✓	✓		
Omalizumab (severe asthma)	>30	✓		✓	✓		
Sunitinib (advanced renal cancer)	50	✓	✓	✓	✓		
Lenalidomide (multiple myeloma)	43	✓	✓		✓		
Somatotropin (growth hormone deficiency)	n/a			✓	✓		✓
Chronic subcutaneous insulin infusion (childhood Type 1 diabetes)	n/a			✓			✓

*End-of-life considerations have only been explicitly taken into account since January 2009 on the basis of supplementary advice from the Institute to the Appraisals Committee. ICER, incremental cost-effectiveness ratio (£ per quality-adjusted life year).

Returning to the main theme...

The three steps of HTA

- **Assessing evidence**
- **Assessing benefit**
- **Assessing cost**

COSTS

- **Exercise – estimate the cost of driving by car from Barcelona to Paris and back**

Cost types

- **Direct costs / indirect costs**
- **Tangible costs / intangible costs**

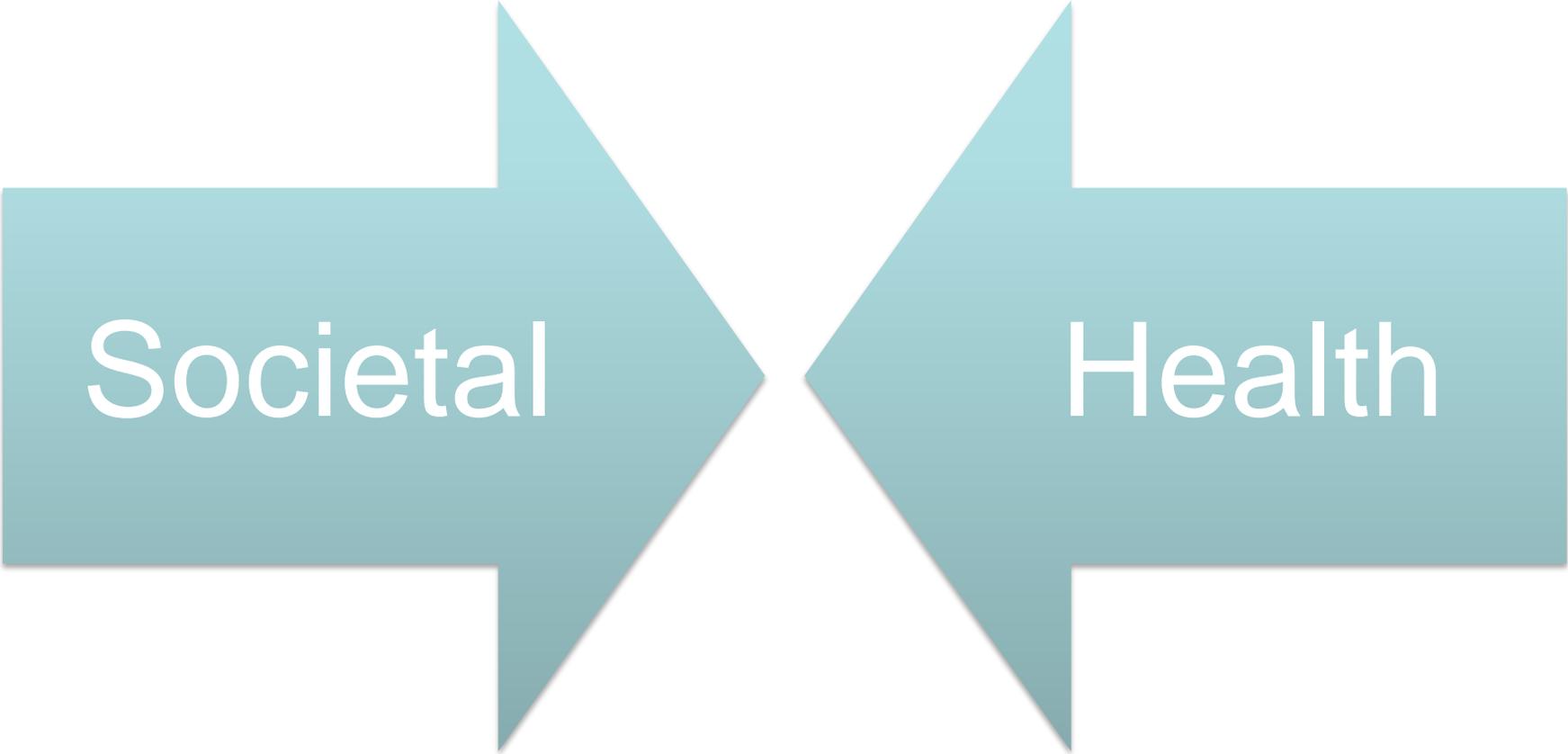
More cost types

- **Unit costs / marginal costs**
- **Incremental costs**

More cost types

- **Opportunity costs**
- **(Budget impact – what if 500 people drove to Paris?)**

'Perspective'



Societal

Health

The three steps of HTA

- **Assessing evidence**
- **Assessing benefit**
- **Assessing cost**

BENEFITS

Benefits

- **Survival**
- **Quality of life**

Assessing benefit

- **Treatment X cures a fatal disease of childhood**
- **Costs £100 000**
- **Extends life by 50 years**

Assessing benefit

- **Treatment Y improves survival in a fatal cancer**
- **Costs £10 000**
- **Extends life by 1 year**

Is there a difference in benefit?

- **Treatment Y**
 - **£10 000**
 - **1 extra year of life**
- **Treatment Z**
 - **£10 000**
 - **1 extra year of life**
BUT...
 - **Patient too ill to get out of bed**

Assessing benefit: the EQ5D

- **Mobility**
- **Self Care – wash and dress**
- **Usual activities**
- **Pain**
- **Anxious or depressed**

Health state A

- **No problems walking about**
- **No problems washing or dressing**
- **Some problems with usual activities**
- **No pain**
- **Not anxious or depressed**

Health state B

- **Some problems walking about**
- **Unable to wash or dress**
- **Some problems with usual activities**

- **No pain**
- **Not anxious or depressed**

Health state C

- **Some problems walking about**
- **No problems washing or dressing**
- **Unable to do usual activities**
- **No pain**
- **Moderately depressed**

Health state D

- **No problem with mobility**
- **No problem with self care**

- **Some problems with usual activities**
- **Extreme pain**
- **Moderately depressed**

Improvement in health state

- **Health state before:**
- **Extreme pain**
- **Moderately depressed**
- **Some problem with usual activity**
- **Health state after:**
- **No pain**
- **No depression**
- **Some problem with usual activity**

Improvement in health state

- Health state before:

0.29

- Extreme pain
- Moderately depressed
- Some problem with usual activity

- Health state after:

0.82

- No pain
- No depression
- Some problem with usual activity

Health gain

- **20 years in health state without treatment**
- **20 years in health state with treatment**

- **Gain = 20 x (difference in quality)**

Growth hormone

- **Extra height as adult: valuation** **0.1**
- **Adult life span** **50 years**



5 QALY gain

- **Cost = £10 000**
- **£2 000 per QALY – cost is justified**

‘Utility’ = what it’s worth

An extra year of life is worth having – it is a utility

An extra year of quality-adjusted life – also a utility

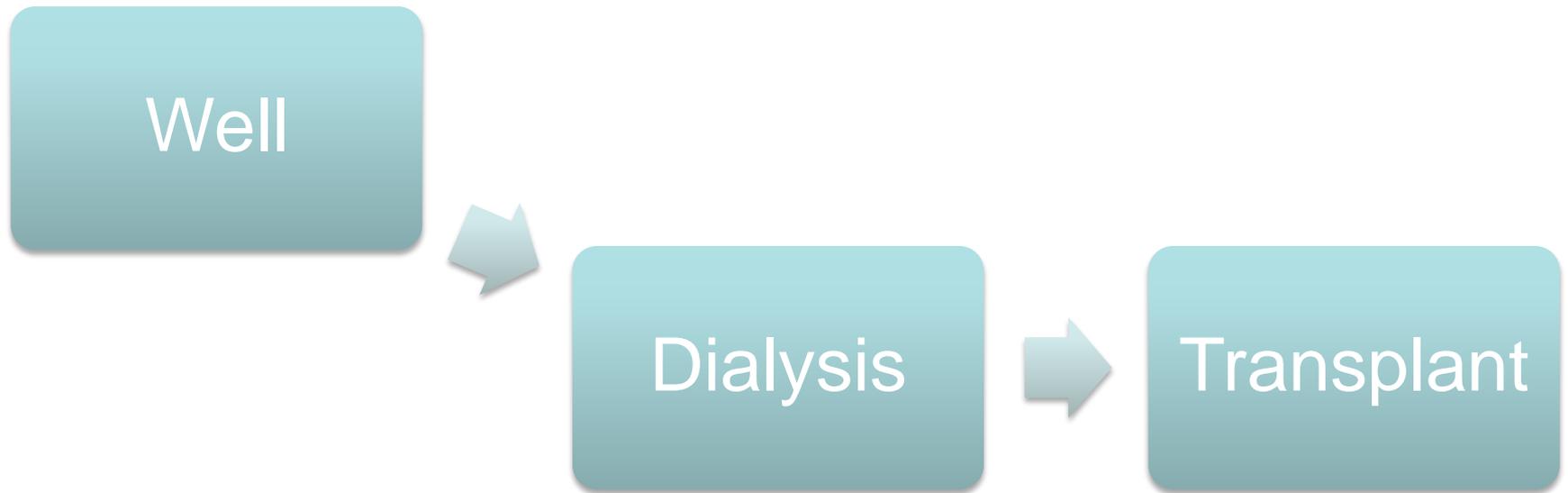
‘... for 50 years’

Time horizon for the analysis

Discounting

MODELLING DISEASE STATES

Disease states



Start

Well
100 people



Not well
0 people

6 months

Well
90 people



Not well
10 people

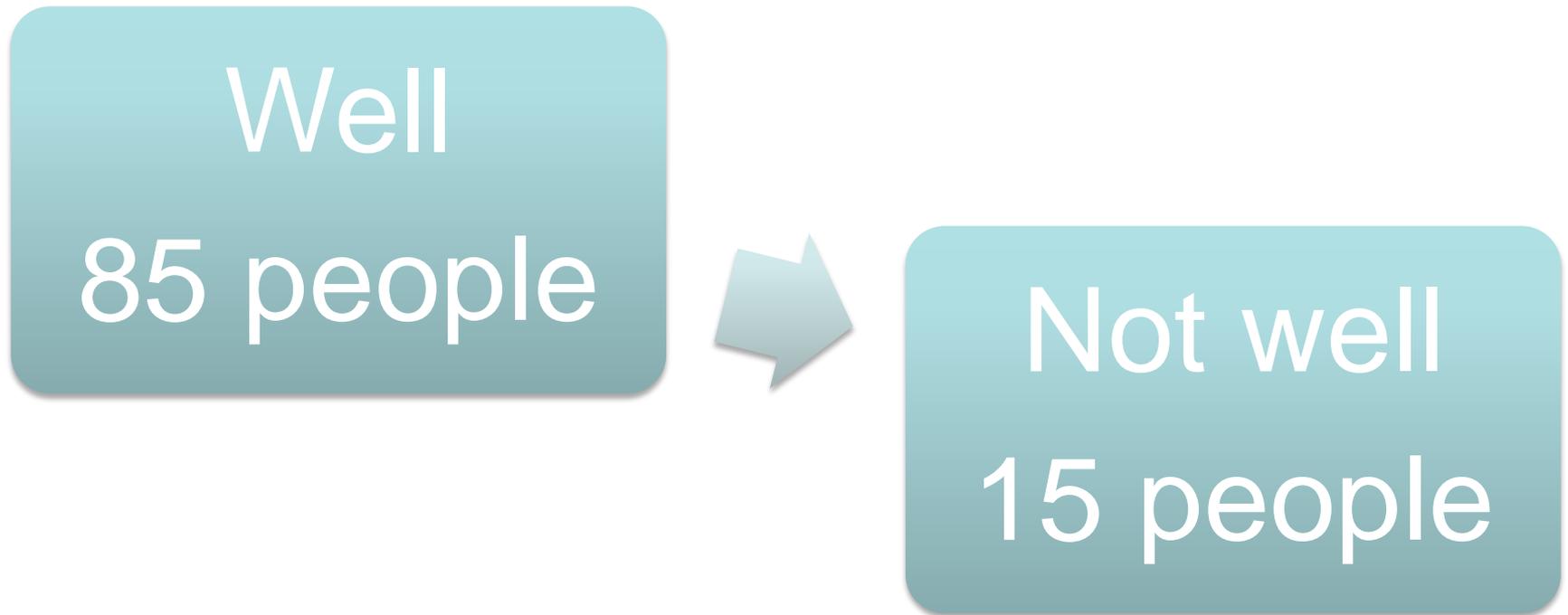
12 months

Well
80 people

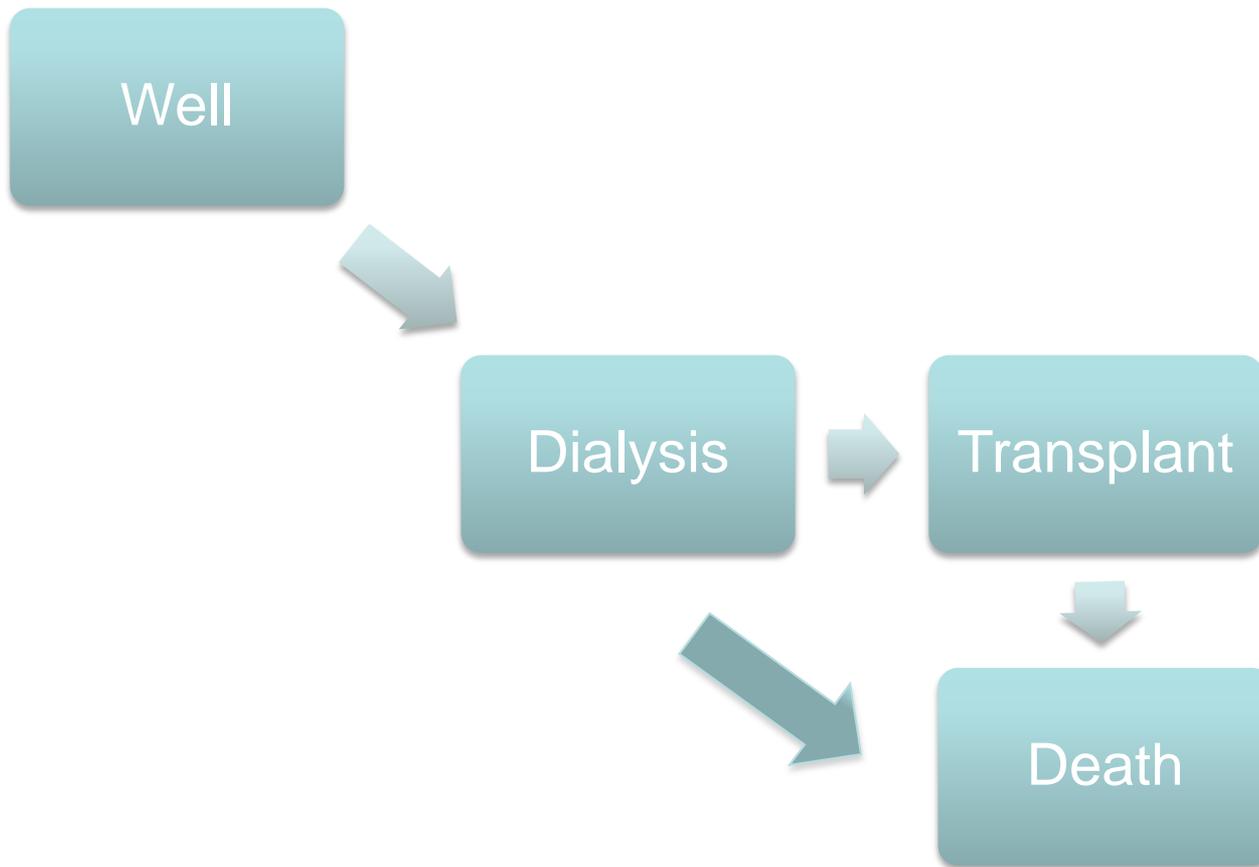


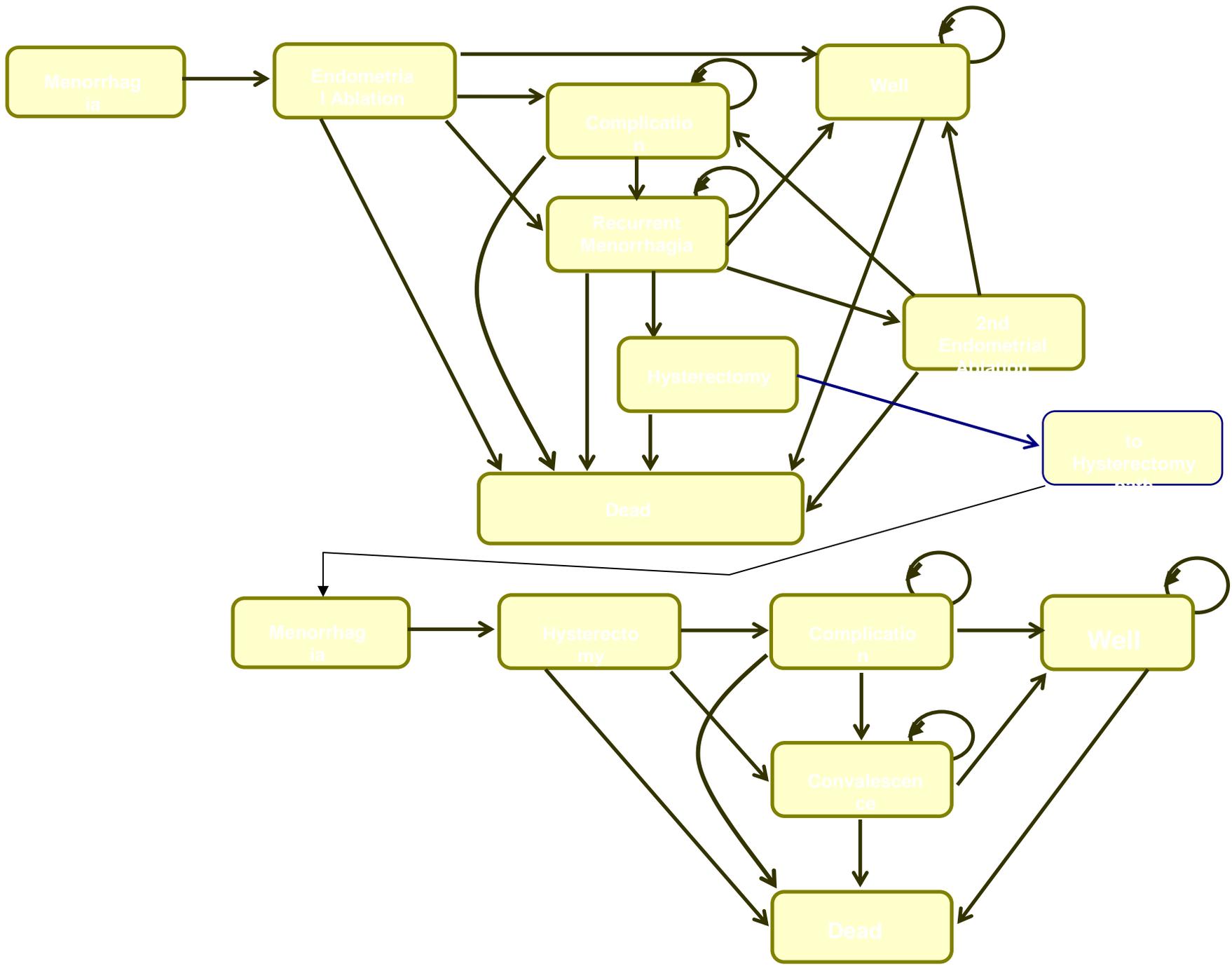
Not well
20 people

12 months – with treatment



Renal disease





How models are used

- Patient move from one state to another
- Model usually assumes change every six months
- Model run for 20 years (or 50 years or...) – the ‘time horizon’

- Patients move from each state to another with a probability – the ‘transition probability’ for that transition
- Treatments change the transition probability – make it less likely to transition from a healthy state to an ill state

- Patients should give the model a common sense check – are all states included? Are the results obviously wrong after 20 years?

VALUES AND PHILOSOPHY

A note on ethics

- **Utilitarianism**
- **Other ethics**
 - John Rawls
 - Amartya Sen

