The woods decay, the woods decay and fall,
The vapours weep their burthen to the ground,
Man comes and tills the field and lies beneath,
And after many a summer dies the swan.
Me only cruel immortality
Consumes; I wither slowly in thine arms,
Here at the quiet limit of the world,
A white-hair'd shadow roaming like a dream
The ever-silent spaces of the East,
Far-folded mists, and gleaming halls of morn.

Tennyson

Questions of fact and questions of value?

- When costs displace health (Δc_h)

$$\Delta h \qquad -\dfrac{\Delta c_h}{k} \qquad \geq 0 \qquad v.\Delta h - \dfrac{v}{k}\Delta c_h \geq 0, \quad or \quad \dfrac{\Delta c_h}{\Delta h} \leq k$$

$\underbrace{}$ Health gained $\underbrace{\phantom{\dfrac{\Delta c_h}{k}}}$ Health forgone

- When costs displace consumption (Δc_c)

$$\Delta h \qquad -\dfrac{\Delta c_c}{v} \quad \geq 0 \qquad v.\Delta h - \Delta c_c \geq 0, \quad or \quad \dfrac{\Delta c_c}{\Delta h} \leq v$$

$\underbrace{\phantom{\dfrac{\Delta c_c}{v}}}$ Consumption forgone

- Costs fall on both

$$\Delta h \qquad -\dfrac{\Delta c_h}{k} \qquad -\dfrac{\Delta c_c}{v} \quad \geq 0 \qquad v.\Delta h - \dfrac{v}{k}\Delta c_h - \Delta c_c \gtreqless 0, \quad or \quad \dfrac{\Delta c_h - \dfrac{k}{v}\Delta c_c}{\Delta h} \gtreqless 0$$

Fact : k = how much health displaced by increased HCS costs?

Value: v = how much consumption should we give up for health?

A scientific question of fact

- Previously (Martin et al JHE 2008)
  - Variations in expenditure and outcomes within programmes
  - Reflect what actually happens in the NHS by programme

	Cancer	Circulation	Respiratory	Gastro-int
04/05 per LY	£13,137	£7,979		
05/06 per LY	£13,931	£8,426	£7,397	£18,999

- Need estimate the overall threshold:
  - How changes in overall expenditure gets allocated across all the programmes
  - How changes in mortality might translate into QALYs gained
  - More (all) programmes (types of QALYs gained and forgone)
  - Reflect uncertainty in any overall estimate (parameters and identification)
  - How it changes with the sign and scale of expenditure change
  - How it changes over time

Social value of different types of health?

- Value of health gained (*and health forgone*)
  - Burden and severity
    - Δh lost as consequence of the condition with current treatment
  - Therapeutic improvement
    - Scale of Δh (some threshold below which it is less valuable)
  - Wider social benefits ($-\Delta c_c$)
    - Cost of care born by patients and carers
    - External consumption effects
  - End of life
- Need to reflect the type and value of health and Δc_c forgone

Social value of health forgone (a single threshold)

- Unweighted QALYs
$$k = \frac{1}{\sum_{i=1}^{I} q_i}, \quad q_i = QALYs \ of \ type \ i \ per \ NHS \ £$$

- Weighted QALYs
$$k^* = \frac{1}{\sum_{i=1}^{I} w_i.q_i}, \quad w_i = weight \ for \ QALYs \ of \ type \ i$$

- Weighted QALYs plus WSBs
$$k^{**} = \frac{1}{\sum_{i=1}^{I} w_i.q_i - \sum_{i=1}^{I} c_i.q_i \Big/ v},$$

$c_i = WSC \ associated \ with \ QALYs \ of \ type \ i$

- Some implications

$$k > k^* \quad if \ some \ w_i > 1 \ when \ q_i > 0 \qquad k^* > k^{**} \quad if \ some \ c_i < 0 \ when \ q_i > 0$$

$$k^* \neq w_j.k, \quad w_j = weight \ associated \ with \ QALYs \ gained \ from \ technoloy \ j$$

End of life?

- NICE supplementary advice for EoL treatments (2009)
  - Criteria
    - Short life expectancy (normally less than 24 months)
    - Evidence of life extension (normally 3 months)
    - Indicated for small patient populations *(supply side motive)*
  - Advice
    - Life extension lived at normal quality of life *(diminishing MRS)*
    - What additional weight would be required make it cost-effective
  - Questions for NICE
    - Is life extension more important than quality at EoL?
    - Do social preferences suggest an additional weight (how large)?
    - Are cut offs or criteria reflective of social preferences?

Pilot study (Koonal Shah, Aki Tsuchiya, Allan Wailoo, NICE DSU June 2011)

- 5 Scenarios (social preferences)
  - EoL (at EoL or unexpectedly at EoL)
  - Life extension
  - Quality of life
  - Time preference
  - Age (preference for young)
  - Qualitative information about the source of preference
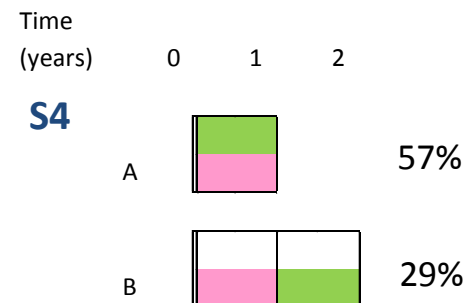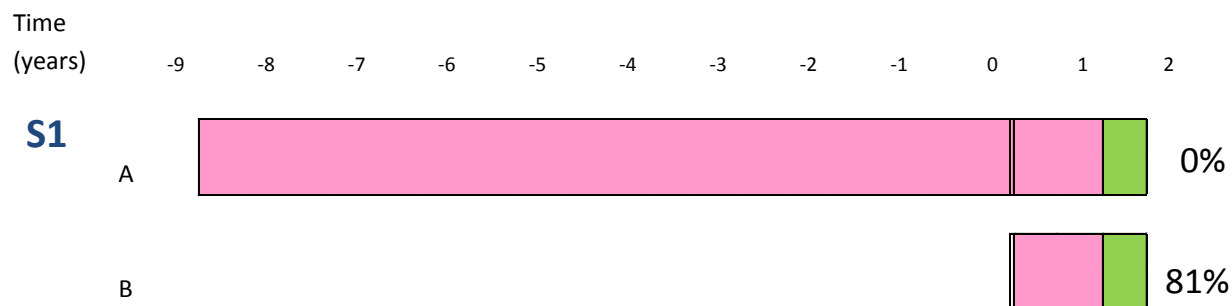
So what role for v?

- Relative value of consumption effects

$$\frac{\Delta c_h - \dfrac{k}{v}\Delta c_c}{\Delta h} \leq k$$

- Weight of different types of health

$$k^* = \frac{1}{\sum_{i=1}^{I} v_i . q_i},$$

$$v_i = consumption\ value\ of\ QALYs\ of\ type\ i$$

- Equivalent of consumption benefits forgone

$$k^{**} = \frac{1}{\sum_{i=1}^{I} v_i . q_i - \sum_{i=1}^{I} \dfrac{c_i . q_i}{v_i}}$$

- Compare an ICER to a *k not* a *v*
- Value based prices are determined by a *k not* a *v*
  - *v* only determines the scale of consumer surplus (if there is any)

Mishan's wild goose chase

- Value a certain state conditional on events
  - Normative content of the axioms of EUT (should we pay for irrationality, regret)?
- Value of a uncertain prospect
  - Low probability of large benefit (variability = unexploited value in the joint distribution)
- Ex-ante or (almost) ex-post
  - Which v would you like?
  - Just choose the thickness of your veil
  - Individual values
  - Moment of the distribution
    - Inconsistent with concern for income or health distribution
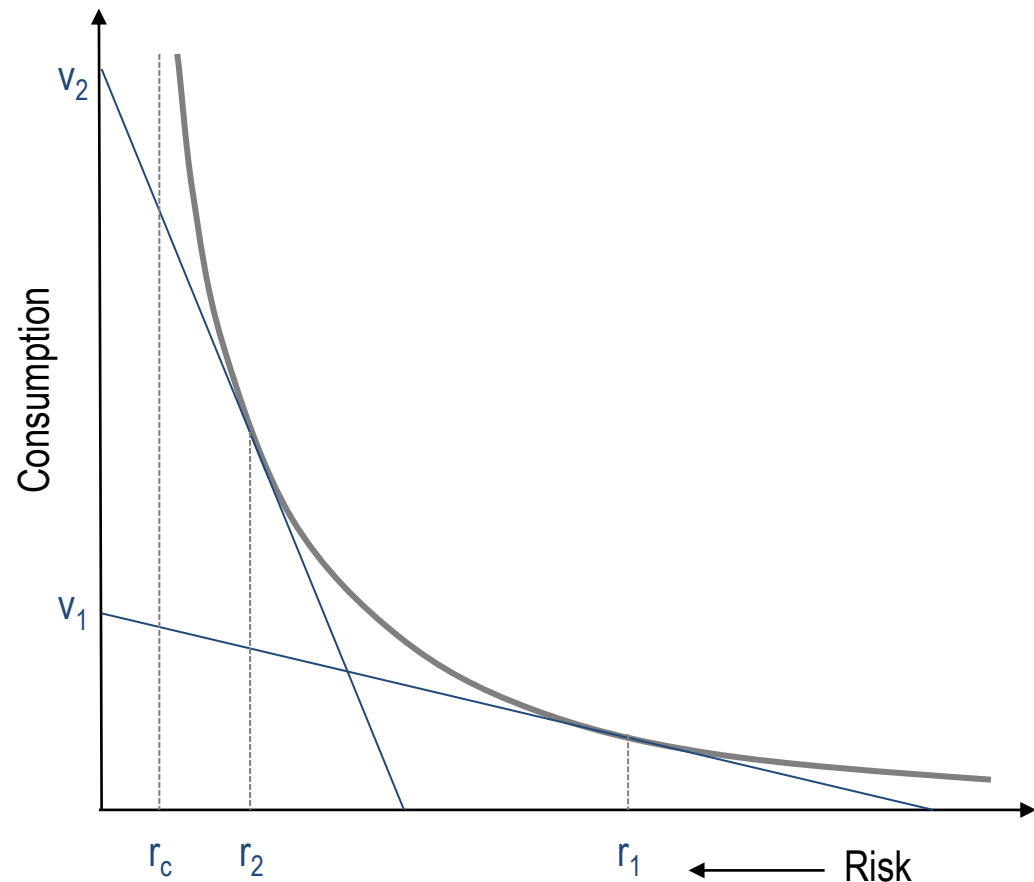
Positive hats and normative rabbits

- John Broome
  - Some things cant not be compensated by roses (or consumption)
  - Only finite compensation if the life is unknown
  - Distinction of known and unknown not relevant for social decisions
  - Not unbounded (large) social value, just using the wrong ruler
- Specify (implicitly) complete and legitimate SWF?
  - v is the measure of social value and presupposes a complete SWF
  - k is simply an inefficient nuisance preventing welfare maximisation
- Welfare function is unknown/latent
  - Partially revealed by legitimate social processes
  - Social good is more than
    - the satisfaction of private wants and desires
  - Purpose of science and discovery is more than
    - the creation of futile hopes and amelioration of private fear
  - k is more than a mere fact
- It is a revealed expression of social value of health generated by collectively funded health care