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Novel Approaches to Value Assessment, Beyond Cost-Effectiveness Framework

Are QALYs really the best we have (& do we really need them)?

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Because we need it & have nothing better



Decision aid

$$V(\text{Benefit}) + \overset{V(\text{Innovation}) + V(\text{Rarity}) + \dots}{\wedge} V(\text{Resource use avoided}) \geq V(\text{Resources required})$$

λ x QALY gain

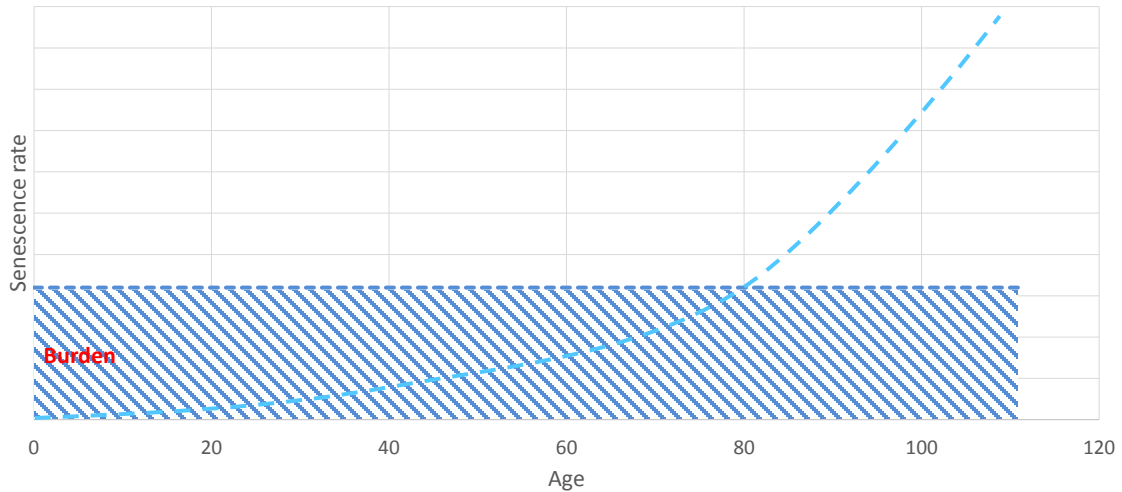
Price

Requirements

- ◆ **Properly addresses the nature of disease (badness)**
 - Zero based (= no disease)
 - No upper end (can always imagine something worse)
- ◆ **Accounts for both**
 - Deadliness (higher mortality)
 - Impact on (quality of) life
- ◆ **Does not impose constant proportional tradeoff or risk neutrality**
- ◆ **Applies properly to all diseases and interventions**
 - Surgery/anesthesia
 - Pediatrics
 - Neonatal & maternal care
 - Vaccines
- ◆ **Has face validity and intelligibility**
- ◆ **Leverages accumulated knowledge, experience, information (e.g., EQ5D).**

Senescence

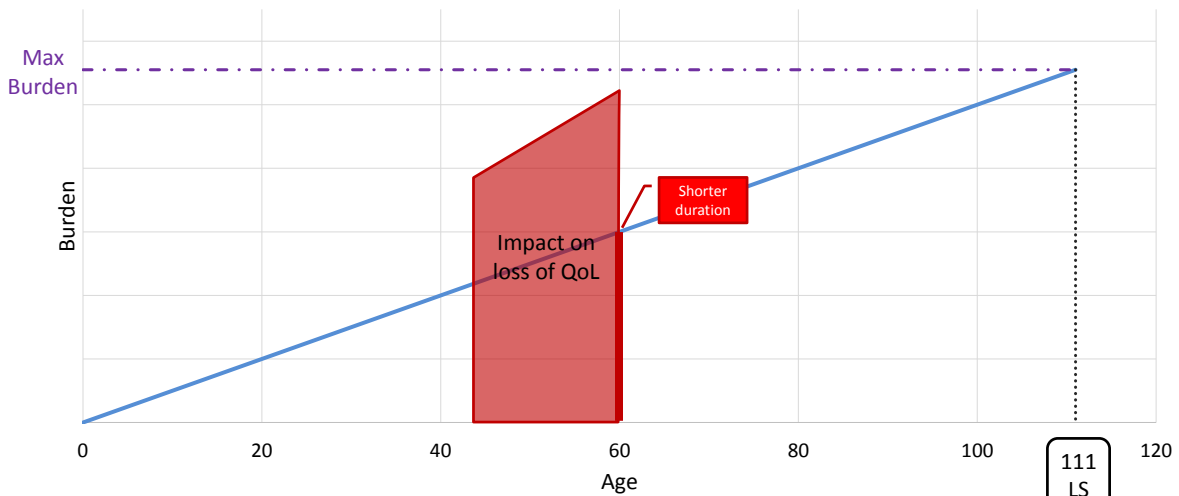
All humans age and die



Bad effects of disease

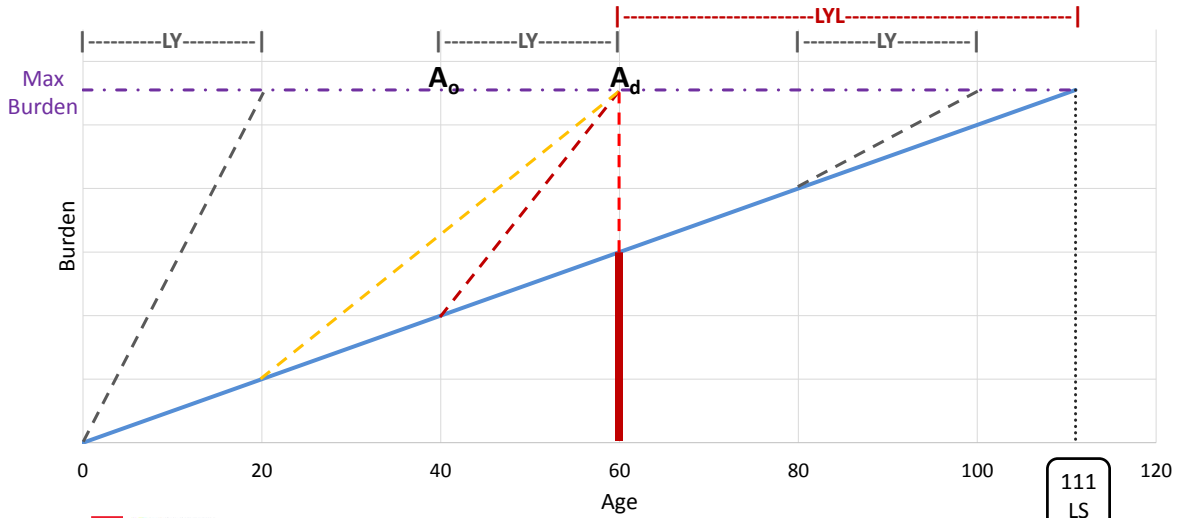
All humans age and die & disease augments the burden of ageing in 2 ways

Burden Augmented by Deadline & Impact on loss of QoL



Deadliness

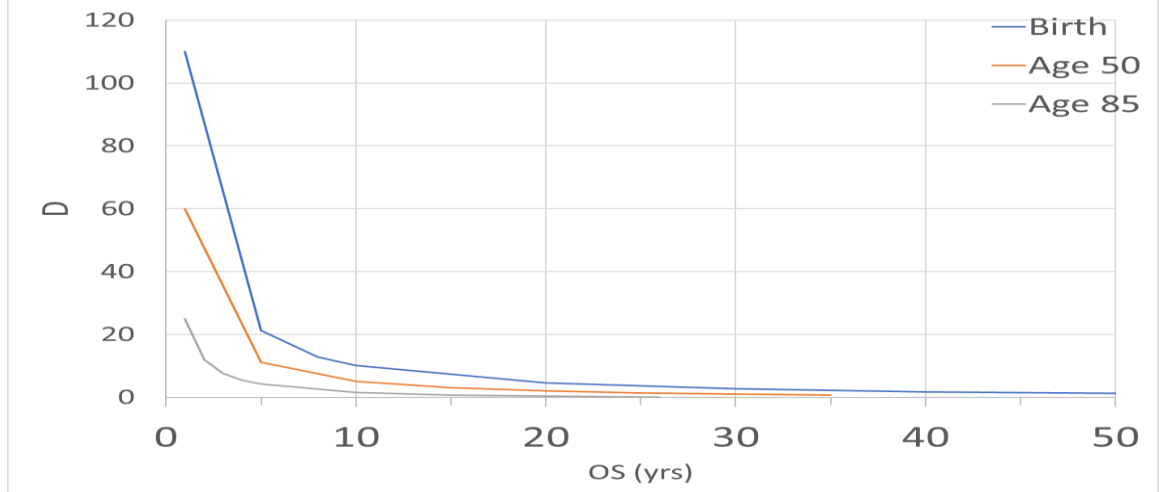
$$\text{Deadliness} = LYL = \frac{LS_o - ES}{ES} \quad \text{Zero-based? } \checkmark$$



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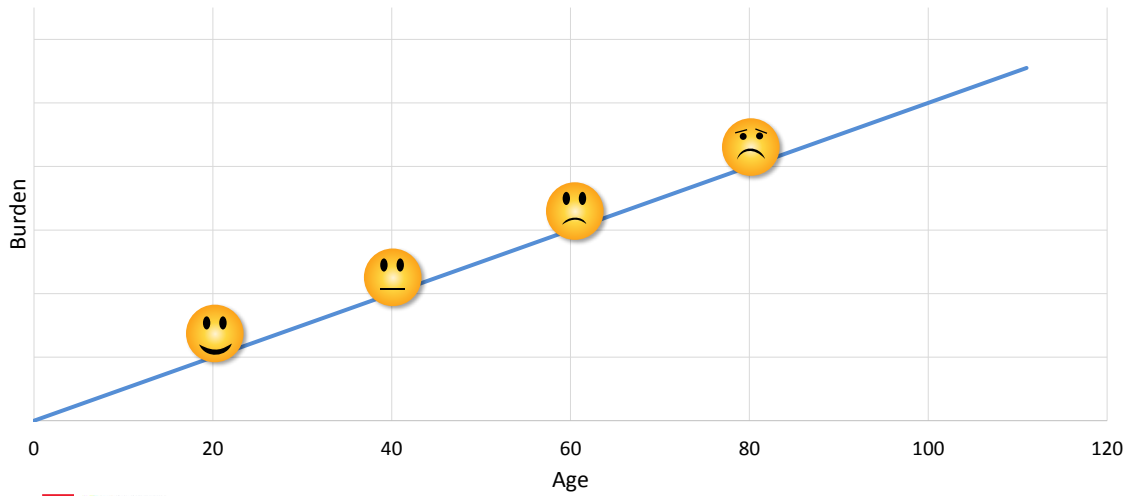
Tasting D

D as a function of Age Onset & OS

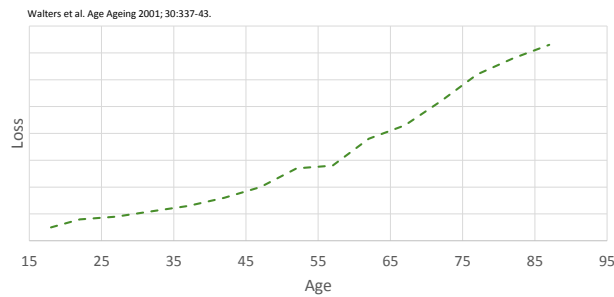
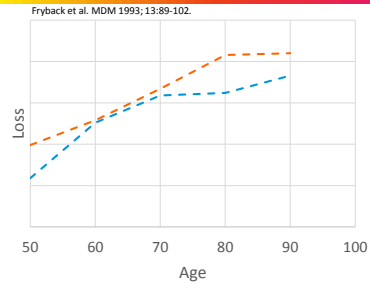
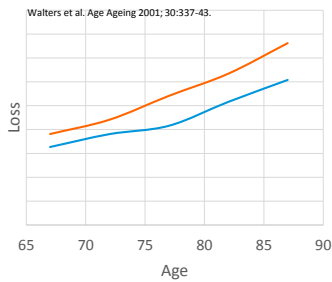


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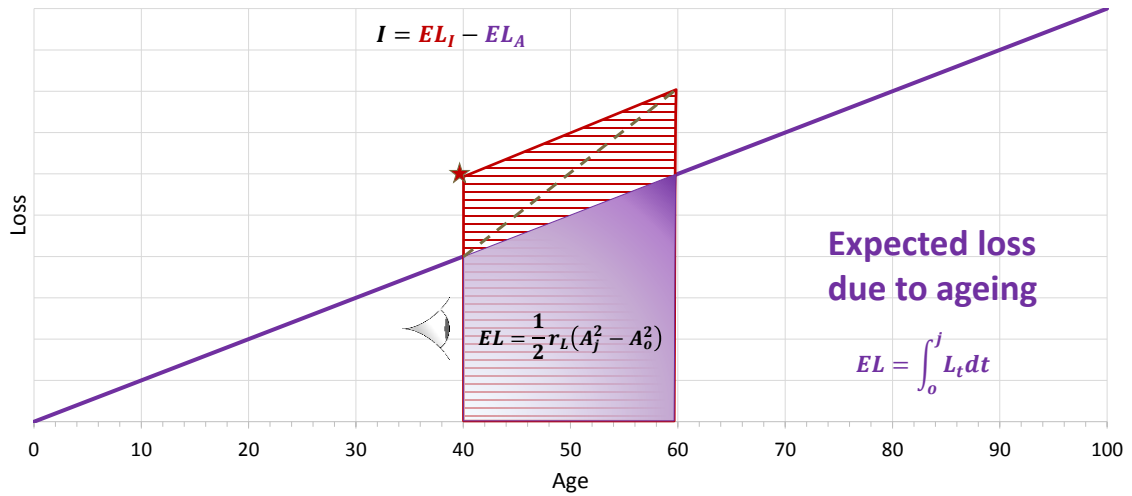
Impact on QoL



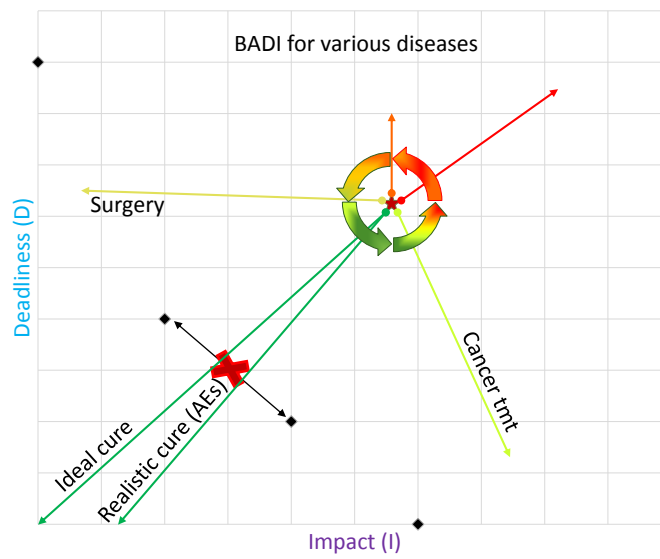
Loss due to burden by age



Loss function



BADI (Burden Augmented by Deadlines and Impact)



Measuring intervention effects using BADI

- Keep the two dimensions separate

- Using cartesian coordinates

- $(\delta D, \delta I)$, hopefully $(-D, -I)$
 - "Reduced BADI"

- Using polar coordinates

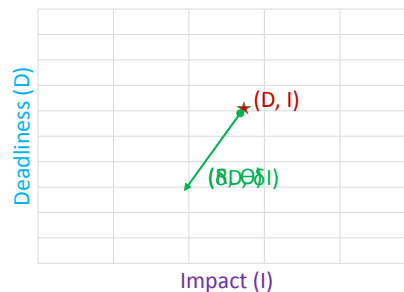
- R is the length of the ray; θ is the angle
 - Interpretability?
 - $180 < \theta < 270$ desirable
 - Longer R better

- Valuation

- Can depend not only on $\delta D, \delta I$ but on (D, I) as well (i.e., consider severity not just effects)

$$V((\delta D, \delta I)|(D, I)) + V(\text{Resource use avoided}) \geq V(\text{Resources required})$$

- Conjoint analysis can handle multiple dimensions and provide monetary valuations
 - Could start with (unmanipulated) EQ5D valuations.



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