



# Disability-Adjusted Life Years

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# Introduction



- Summary Measures of Population Health
- DALYs in Burden of Disease
- DALYs in Cost-Effectiveness Analyses

# Summary measures of population health



“Measures that combine information on mortality and non-fatal health outcomes to represent the health of a particular population as a single number”

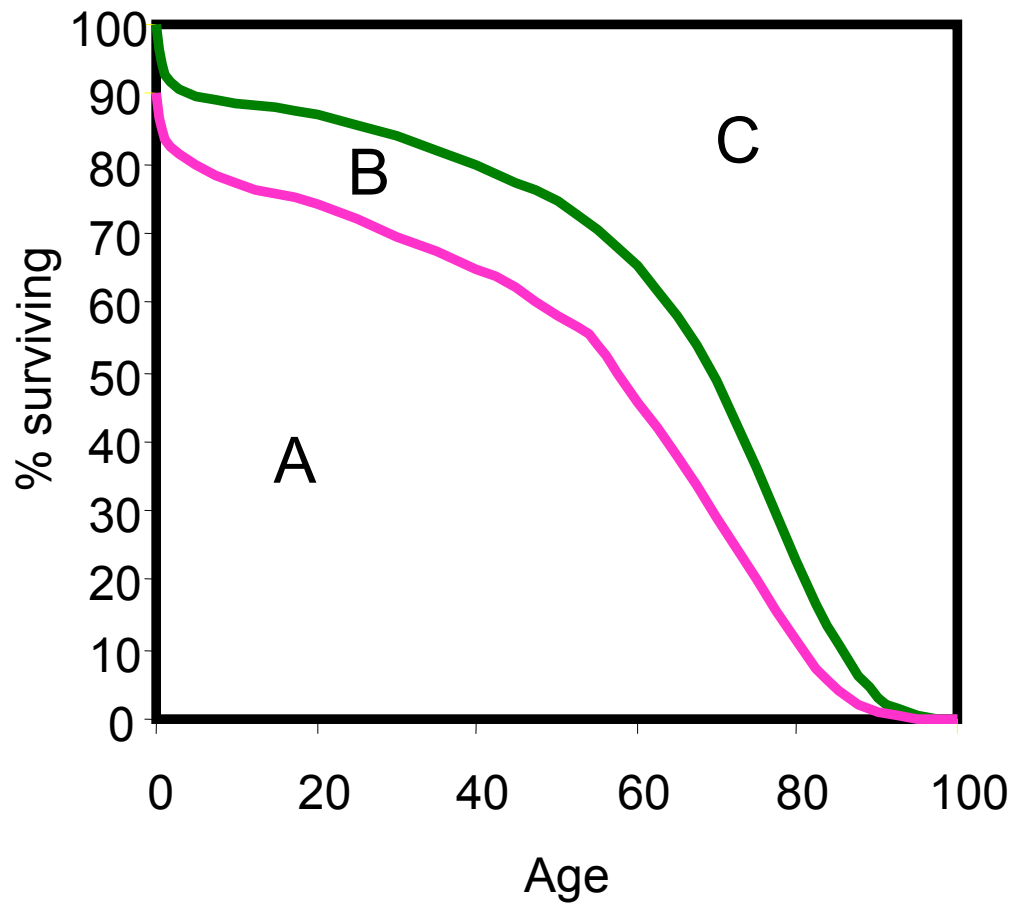
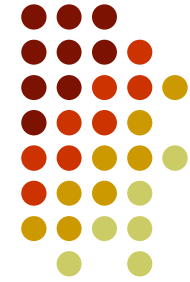
# Summary measures of population health



Two classes of Summary Measures of Population Health:

- ❖ Health expectancy
- ❖ Health gap measure

# A typology of summary measures



Health Expectancy =  
 $A + f(B)$

Health Gap =  
 $C + g(B)$

# DALYs as a health gap measure



Measures a population's health against a 'normative survivorship goal', an ideal in which everyone lives into old age free of disease

- ❖ Survivorship measured against life expectancy standard modelled on Japanese women
- ❖ Non-fatal health outcomes defined as all departures from full health

# Health Gaps: Social values



1. How long should people in good health expect to live? → **standard life expectancy**
2. Are all people equal? → **use of same standard life expectancy regardless of local LE**
3. How compare years lost due to death with years lived in poor health? → **DW using Person Trade-Off protocol**
4. Value of future years of life? → **discounting**
5. .... **Age weighting?**

essential

optional

## Disability weights



Global Burden of Disease study I weights:

- ❖ derived by panel of international public health experts
- ❖ using person trade-off protocol for 22 ‘tracer conditions’
- ❖ Interpolation of >400 other health states by distribution across 7 disability classes
- ❖ Where relevant distinction between ‘treated’ and untreated conditions

# Disability weights



Subsequent developments:

- ❖ Dutch study also using Person-Trade Off methods with three panels (2 HW, 1 academics)
- ❖ Standardised description of health states in EQ5D+ plus health state label
- ❖ World Health Surveys early 2000s: lots of 'noise' and inter-country variability in survey responses asking for VAS
- ❖ Plans for current update of GBD: multi-country surveys with pair-wise comparisons



## Person-trade off

“You are a decision maker.

You need to make one of two choices.

**Choice A:** You can keep 100 people in perfect health alive for exactly one extra year (and then they all die)

**Choice B:** You can restore xxx people in health state Y (e.g. blindness) to full health for one year (and then they all die)”

→ Keep probing until ‘point of indifference’, e.g.  
250 people with blindness  $\approx$  100 healthy people

→  $DW = 100/250 = 0.40$

## DALYs in Burden of Disease



DALY is health gap measure:

- ❖ Future stream of life lost for each death in a particular year (measured against the 'standard')
- ❖ Future stream of health lost due to illness/disability for each incident case of disease & sequelae  
(Incidence x average duration x DW)
- ❖ Discounted at 3%



## DALYs in Cost-Effectiveness

- ‘DALY’ better described as health expectancy
- ❖ Difference in years lived between intervention and comparator groups → life expectancy of population of interest
  - ❖ Adjustment of these years lived for loss of health from non-fatal conditions
  - ❖ Critical difference with QALY is derivation of weighting of non-fatal health loss