Does the choice of life table in burden of disease studies impact how causes are ranked?

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What was the purpose and aims of this research?

- In BOD studies, counts of mortality are transformed to estimated of YLL through the use of life tables
- The choice of life table directly effects estimates of YLL and composition of DALYs
- Relative position of YLD 'causes' are also indirectly affected (e.g. depression)
- Aim to describe the differences in DALY rank, number and composition of DALYs for causes of disease between national and aspirational life table approaches

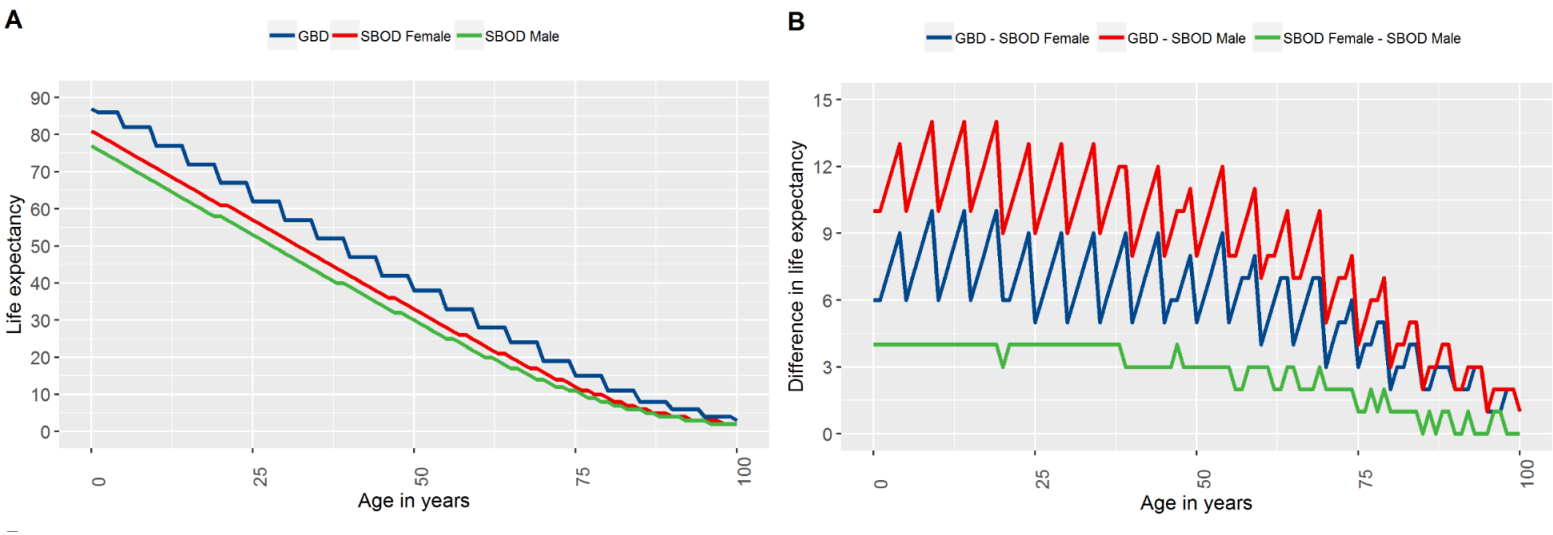
How did we carry out this study?

- Estimates of YLD and mortality for 68 causes were used from the Scottish Burden of Disease study (2014-16)
- Mortality estimates were translated into YLL using*:*
    - *i)* Scottish national life tables (sex-specific; single year)
    - *ii)* GBD 2017 aspirational life table (unisex; abridged)
- Two-sets of DALYs were calculated: DALYs(Scotland) and DALYs(GBD Aspirational)

- Difference in rank of causes by DALYs (Scotland vs. GBD aspirational)
- Absolute and relative differences in number of DALYs
- Difference in YLL:DALYs ratio

Context: Comparing the life tables used

- Life expectancy at birth: 87 years vs. 82 years (F)/77 years (M)
- Differences slowly diminish over the life-course



Results: Comparing ranks of causes

- Leading 20 causes were the same, although order differs
- LBNP and depression (2nd and 3rd) drop to 5th and 6th when an aspirational life table was used
- Lung cancer and cerebrovascular disease (4th and 5th) became 2nd and 3rd

	SBOD	GBD
	Both sexes	
Ischaemic heart disease	1	1
Lower back and neck pain	2	5
Depression	3	6
Tracheal, bronchus, and lung cancer	4	2
Cerebrovascular disease	5	3
Alzheimer's disease and other dementias	6	4
Migraine	7	10
Drug use disorders	8	9
Chronic obstructive pulmonary disease	9	7
Anxiety disorders	10	11
Sensory conditions	11	13
Other cancers	12	8
Other cardiovascular and circulatory diseases	13	12
Diabetes mellitus	14	15
Alcohol dependence	15	18
Suicide and injuries from self-harm and interpersonal violence	16	16
Cirrhosis and other chronic liver diseases	17	14
Colon and rectum cancer	18	17
Breast cancer	19	20
Lower respiratory infections	20	19

Results: Change in number of DALYs

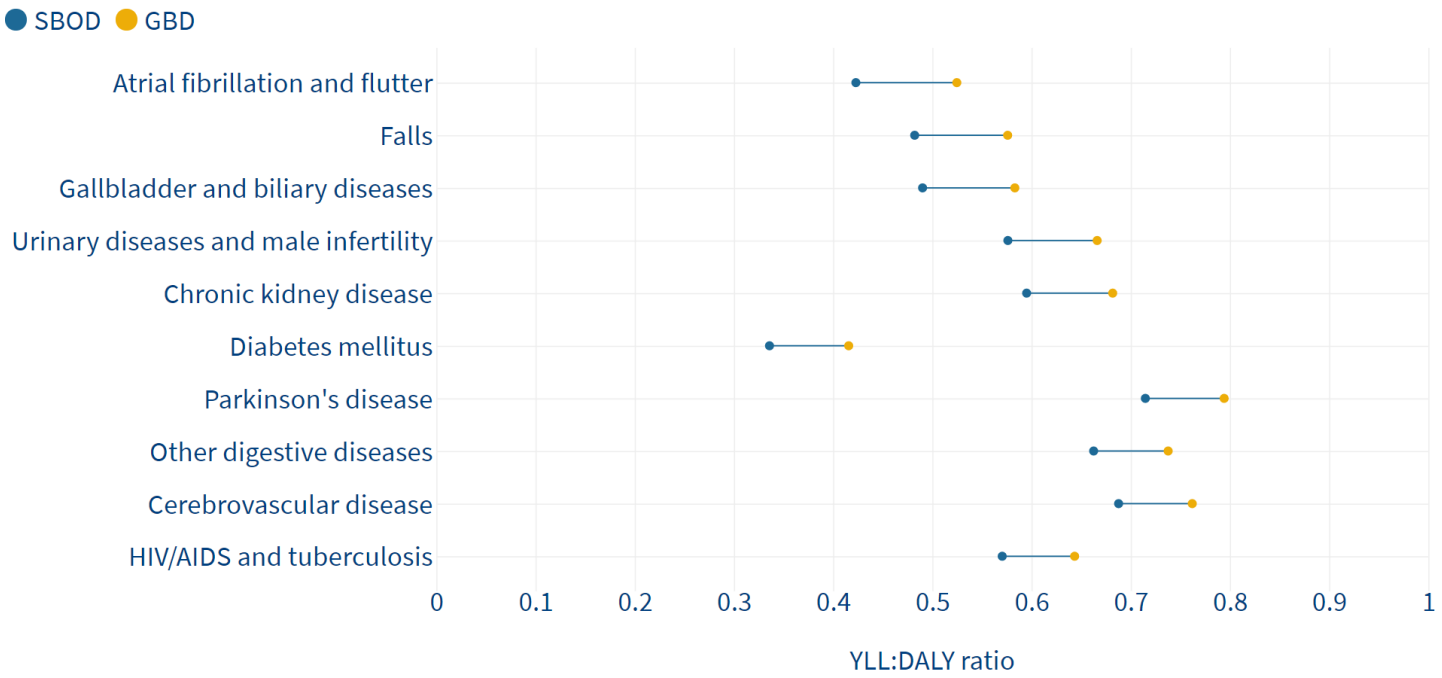
- Overall number of DALYs increased (20%)
- Largest increases: Ischaemic Heart Disease DALYs (37k, or 39%); lung cancer (24k; or 41%); Alzheimer's and dementia (19k, or 40%)

Cause	N	%
Ischaemic heart disease	36,688	39%
Tracheal, bronchus, and lung cancer	23,711	41%
Alzheimer's disease and other dementias	19,426	40%
Cerebrovascular disease	17,562	31%
Other cancers	14,661	35%
Other cardiovascular and circulatory diseases	10,457	31%
Chronic obstructive pulmonary disease	10,424	22%
Lower respiratory infections	9,194	41%
Colon and rectum cancer	9,064	36%
Cirrhosis and other chronic liver diseases	8,324	30%

- No change for 8 causes (LBNP, depression, migraine, anxiety, sensory conditions, osteoarthritis, dental health disorders, tension-type headache)

Results: Composition of DALYs (YLL:DALY ratio)

- All-cause ratio increased by 8 percentage points



- Larger changes were mostly apparent for conditions with sizeable contributions of both YLD and YLL to DALYs

Implications of findings

- Results highlights the large disparities that can occur as a result of the choice of life table (across ranks, rates and DALY composition)
- Ranks of non-fatal causes are highly sensitivity to the life table used
- The composition of DALY was most affected for conditions with sizeable YLD and YLL
- Considerations may be required over what methods are most appropriate for national contexts, e.g. in strategic needs assessment, or for future impact of interventions