

## Supplement: Calculation of DALYs

The inclusion of discounting and age-weighting results in the following complex DALY equations:

$$YLL = \frac{KCe^{ra}}{(r + \beta)^2} [e^{-(r+\beta)(L+a)} [-(r + \beta)(L+a) - 1] - e^{-(r+\beta)a} [-(r + \beta)a - 1]] + \frac{1 - K}{r} (1 - e^{-rL})$$

where a = age of death (years), r= discount rate (3% in this study),  $\beta$  = age-weighting constant ( $\beta = 0.04$ ), K = age-weighting modulation constant (K = 1), C = age-weighting correction constant (C=0.1658) and L = country-specific standard life-expectancy at age of death (years)

and

$$YLD = DW \left\{ \frac{KCe^{ra}}{(r + \beta)^2} [e^{-(r+\beta)(L+a)} [-(r + \beta)(L + a) - 1] - e^{-(r+\beta)a} [-(r + \beta)a - 1]] + \frac{1 - K}{r} (1 - e^{-rL}) \right\}$$

where DW= disability weight (DW=0.271 for TB) and a = age of onset of disability (years).

Accordingly the following formulas in Excel were used for calculation of lost years of life lived with disability due to TB disease:

$$YLD \text{ (sensitive TB): } 0.271 * (1 * 0.1658 * \text{EXP}(0.03 * 45.1) / (0.03 + 0.04)^2) * (\text{EXP}(-1 * (0.03 + 0.04) * (0.5 + 45.1)) * (-(0.03 + 0.04) * (0.5 + 45.1) - 1) - \text{EXP}(-1 * (0.03 + 0.04) * 45.1) * (-(0.03 + 0.04) * 45.1 - 1)) + ((1 - 1) / 0.03) * (1 - \text{EXP}(-1 * 0.03 * 0.5))) = 0.1648$$

$$YLD \text{ (MDR-/XDR-TB): } 0.271 * (1 * 0.1658 * \text{EXP}(0.03 * 45.1) / (0.03 + 0.04)^2) * (\text{EXP}(-1 * (0.03 + 0.04) * (2 + 45.1)) * (-(0.03 + 0.04) * (2 + 45.1) - 1) - \text{EXP}(-1 * (0.03 + 0.04) * 45.1) * (-(0.03 + 0.04) * 45.1 - 1)) + ((1 - 1) / 0.03) * (1 - \text{EXP}(-1 * 0.03 * 2))) = 0.6361$$

Assuming an average duration of 2 years of untreated or inadequately treated TB disease until death, YLL due to TB mortality from the age of 47 (45.1 plus 2 years) onwards are:

$$(1 * 0.1658 * \text{EXP}(0.03 * 47.1) / (0.03 + 0.04)^2) * (\text{EXP}(-1 * (0.03 + 0.04) * (32.6 + 47.1)) * (-(0.03 + 0.04) * (32.6 + 47.1) - 1) - \text{EXP}(-1 * (0.03 + 0.04) * 47.1) * (-(0.03 + 0.04) * 47.1 - 1)) + ((1 - 1) / 0.03) * (1 - \text{EXP}(-1 * 0.03 * 32.6))) = 18.64$$