# Codebook for R Tool on Covid19 QALYS

* Tool by Prof Andrew Briggs developed in Excel information: <https://www.lshtm.ac.uk/research/centres-projects-groups/chil#covid-19>
* Based on v4.0 of Excel tool
* R code written by Nichola Naylor June 2020 – available on CHiL Github <insert link> , MIT license
* ShinyApp available: <insert link>

## Inputs

* CSV files with the following information:
  + Life table – probability of dying between ages x and x+1
    - Note copied this for x=100 to x=120
  + qol(X) = Population quality of life norms for different ages
  + Age distribution of deaths from covid19
* User inputs:
  + Discount rate (r)
  + Standard mortality ratio (SMR) - summarizes how a given comorbidity can increase the risk of dying. For example, an SMR=1 shows no adjustment for comorbidities. [[1]](#footnote-1)
  + qCM – comorbidity impacts on QALYs
  + Choice of country, current options are (see data dictionary for sources):
    - Canada
    - Israel
    - Norway
    - UK
    - USA
  + To add your country data – will include an option for this in next version.

## Outputs

* Mean life expectancy loss associated with Covid19 per 100,000 population
* Mean quality-adjusted life expectancy loss associated with Covid19 per 100,000 population
* Mean quality-adjusted life years lost associated with Covid19 per 100,000 population

## Functions

* q(x) = probability of dying between x and x+1
* d(x) = -ln(1-q(x))
* l(x) = number surviving to age per 100,000= l(x-1) \* exp(-d(x)\*SMR) , where l(0)=100,000
* l(x) is estimated for females and males separately, and then averaged to get a “person” estimate using:
  + proportion female =
* L(x) = (l(x)+l(x+1))/2
* , is the upper bound of life-expectancy reported in the life table (e.g. 100 years old for the UK).
* z(x) = L(x)\*qol(x)\*qCM
* B(x) =
  + For example, if a person died at age 2 , for u=2,3…. :
  + B(2) = + + ….+
* dQALY(x) =
* Weighted loss(LE) = , where = proportion of covid19 deaths of age x (for the purposes of this tool this is the mean age of the specified groupings).

1. Using life table methods to calculate QALY losses from deaths: with application to COVID-19, Andrew Briggs, LSHTM, May 13, 2020 [↑](#footnote-ref-1)